INSTITUTIONS OF SURGERY.

PART the SECOND.

SECT. III.

Of Diſorders in the NECK, *curable by the Hands and Inſtruments.*

CHAP. XCIX.

The Method of extracting and removing ſmall Bones of Fiſh and other Animals, Plum-ſtones, Pins, and Needles, &c. *ſticking in the* Fauces *or* Gula.

AS the moſt acute Pains and Inflammation, with a Train of malignant Symptoms and ſometimes Suffocation, are frequently occaſioned by foreign Bodies ſticking in the *Fauces* or *Œſophagus*; it ought to be the principal Care of the Surgeon to remove them with all poſſible Expedition. To effect this, the Patient may be directed to a large Draught of ſome Liquor, or to forcibly ſwallow a large mouthfull of Bread, Meat, or Pulp of ſome Fruit; but if the Diſorder be rather made worſe than better by theſe Attempts, he muſt then have immediate Recourſe to ſome Inſtrument. The Tongue is to be firſt depreſſed with a Spatula, in order to obſerve whether the Obſtacle can be ſeen; and if it appears near the upper Part of the *Œſophagus*, it ſhould be cautiouſly extracted by introducing the Pair of Plyers in *Tab.* III. *Fig.* 3. or by ſome ſuch other inſtrument: But if it is lodged deep in the *Œſophagus*, he may then give the Patient a Piece of Sponge to ſwallow that has been firſt dipt in Oil and well faſten'd to a ſtrong Cord, by which it is to be pulled up again, after it has been ſwallowed by the Patient as far as it will go; by which means the Body ſticking in the *Œſophagus* will be by the

Sponge forced down into the Stomach, or elſe drawn up into the Mouth. But the ſame Intention may be anſwered better, if the oily Sponge be faſtned to a long whalebone Probe (as at *Tab.* XXI. *Fig.* 10. BB) and then gently thruſt into and drawn out of the *Œſophagus*. This laſt Inſtrument has been ſucceſsfully uſed by myſelf, in a Countryman, who had a Bone as big as one's Thumb ſtuck in his *Fauces* above four and twenty Hours; but was by this preſſed down into his Stomach, and the Man recovered; after whom, I ſeveral Times experienced the Succeſs of the ſame Inſtrument in others. Some Surgeons have deſcribed and figured ſeveral other Inſtruments for this ſame Purpoſe, as HILDANUS Cent. 1. Obſ. 26. SCULTETUS Tab. VI. and GARENGEOT in his Treatiſe of Inſtruments; but if neither of them, nor the forementioned, are at hand, a Piece of flexible Wax-candle, of about two or three Spans long and Thickneſs of one's Finger, may be ſometimes conveniently uſed in their Stead.

CHAP. C.

Of the BRUSH *for ſcowering the Stomach.*

RElated to the foregoing Inſtruments is the *Excutia Ventriculi* or cleanſer of the Stomach, as it is called by ſome of our modern Phyſicians; being compoſed of ſoft Hair, faſtened by twiſted Braſs or Steel-wire into a *Faſciulus*, as in *Tab.* XXI. *Fig.* 11. the Handle or Stem of which may be inveſted with Silk or Thread. This Inſtrument is recommended by ſeveral eminent Phyſicians as being principally uſeful to ſcower or cleanſe the Stomach as well as remove foreign Bodies out of the *Fauces* and *Œſophagus*. The Directions they give for the Uſe of it, are, always to let the Patient drink a ſmall Draught of warm Water, others recommend Spirit of Wine, before the Operation, that the Mucus and Foulneſs of the Stomach may be waſhed off thereby: Then, the Bruſh A being moiſtened in ſome convenient Liquor is to be introduced into the *Œſophagus*, and ſlowly protruded into the Stomach by twiſting round its Wire-handle BB. When arrived in the Stomach, it is to be drawn up and down, and through the *Œſophagus*, like the Sucker in a Syringe, till it be at laſt wholly extracted. Some recommend plentiful drinking in the Operation, to be continued till no more Foulneſs is diſcharged. But though this Contrivance is greatly extolled, and ſaid to prolong Life to a great Age, eſpecially if practiſed once a Week, Month, or Fortnight; yet there are very few Inſtances of its happy Effects: And if there were, I believe few would be willing to ſuffer the Pain, danger of Suffocation, and other Injuries which attend the Uſe of ſo offenſive an Inſtrument. More may be ſeen on this Head in a Controverſy publiſhed on the Subject, between WEDELIUS and TEICHMEIRUS: In which this is demonſtrated to be no new Inſtrument, having been long before deſcribed by others.

CHAP. CI.

Of the WRY NECK.

I. WE ſome Times meet with People who have their Necks and conſequently their Heads diſtorted more to one Side than the other; which is by TULPIUS[a] and others termed *Caput Obſtipum*, probably after HORACE[b]. This Deformity is uſually brought into the World with the Infant, or elſe occaſioned afterwards, by ſome Accident. When it is from the Birth, there is hardly any Room to expect a Cure, becauſe the Vertebræ of the Neck are rendered crooked by that poſture, while the Bones are in a ſoft and pliable State, though there are ſome ſurpriſing Inſtances in TULPIUS[c], MEEKREN[d], ROONHUY'S[e], of young People who have had the wry Neck from their Birth for the Space of 12, 16, or 18 Years, notwithſtanding which, they have been reſtored to their natural Streightneſs and Uniformity. When the Diſorder comes by Accident after the Birth or in Adults, the Cauſe is uſually a Contraction of the Skin on one Side by burning, or from a Spaſmodic and ſtrong Contraction of one of the Maſtoide Muſcles, repreſented at *Fig.* 12. AA. which at length becomes ſhorter and indurated by continuing in that Poſture; or it may proceed from a Relaxation of one or more of thoſe Muſcles, in conſequence of which the Neck will be contracted by the ſtronger antagoniſt Muſcle on the oppoſite Side; or laſtly, it may in the opinion of ROONHUY'S proceed from a preternatural Ligament drawing down the Head; and when either of theſe are the Cauſe of this Diſorder it ought not to be rejected as incurable, eſpecially if it appears to be of no long ſtanding and in a young Subject. Riſe of the Diſorder.

II. In order to cure this Diſorder, if it be recent, and cauſed by a Catarrh or Defluxion of ſuperfluous Humours, evacuating Medicines, with the Adminiſtration of mild Sudorifics and Heat are very ſerviceable; but when it ariſes from other Cauſes, and particularly the forementioned Contraction of a Muſcle, or of the Skin by burning, the Surgeon then ought to try the Uſe of Fomentations and Ointments with emollient Oils and Emplaſters, by the repeated Application of which the contracted Parts may be ſometimes relaxed. In the mean Time the Head is to be held inclined towards the oppoſite Side by a proper Bandage for this Purpoſe. NUKE and SOLINGEN direct us to a proper Inſtrument made of Steel with a ſoft Collar as in *Tab.* XXI. *Fig.* 13. the Collar of this Inſtrument marked AA being put upon the wry Neck, and being faſtened by a Rope to the Ring C, the Patient is to be ſuſpended thereby ſeveral Times in a Day, once every Quarter of an Hour, or as often as may be convenient, till the Neck has acquired its ſtraight and natural Poſition. If theſe Means prove of little Service, as TULPIUS and ROONHUY'S tell us they frequently are, or if the Diſorder is become too inveterate, the Surgeon ſhould then proceed to the Operation. 1st Method of Cure.

III. Therefore if the Diſorder proceeds from a Contraction of the Skin by burning, it will be neceſſary to divide the contracted Parts of the Skin by one or more tranſverſe Inciſions, made with great Caution to avoid wounding the jugular Vein, the Inciſions are afterwards to be dilated by dreſſing them with 2d Method of Cure.

[a] Obſerv. Medic. Lib. IV. Cap. 58. [b] 2 Satyr. V. 92. [c] Loc. citat. [d] Obſ. Chirurg. 33. [e] Obſ. Chirurg. 22 *and* 23.

dry Lint, and treated with ſome digeſtive Ointments, as in other Wounds; taking Care to keep the Neck all along inclined towards the oppoſite Side by a proper Bandage, till it is ſufficiently elongated on the contracted Side by the new Supplies of Fleſh and Skin in the Inciſions, to reſtore the Head to it's right Poſition.

3d Method of Cure. IV. But if the wry Neck proceeds from a Contraction of one of the Maſtoide Muſcles, or from ſome Ligament, they are to be divided by a tranſverſe Inciſion, with the crooked Scapell in their lower Part near the Clavicle or Sternum, taking Care to avoid any conſiderable Artery or Vein that might occaſion a dangerous Hæmorrhage. In order to ſtop the Blood after the Operation the Wound is to be filled with dry Lint, and afterwards healed with a large Cicatrix by digeſtive Ointments, with *ol. Hyperici*, *Balſ. Capiv.* which are recommended by ROONHUY'S. TULPIUS, MEEKREN, and ROONHUY'S, indeed, tell us of Caſes that have occurred to them, in which the Head has immediately recovered it's proper Poſition, upon dividing the preternatural Ligament or Tendon by which it was inflected. For the reſt, in all the Methods of Cure a proper Bandage ſeems neceſſary, to retain the Head and Neck in a proper Poſture, till they have recovered their natural Situations; concerning which Bandage Authors are ſilent, as are all the modern *French* Surgeons upon this Diſorder, and its Method of Cure, which ſeems a little ſurpriſing; but they who deſire more particular Obſervations on this Subject may conſult TULPIUS Lib. IV. Cap. 58. with MEEKREN, Cap. 33. and ROONHUY'S Obſ. 22, 23.

CHAP. CII.

Of BRONCHOTOMY, LARYNGOTOMY, *or* TRACHEOTOMY.

In what Caſes this Operation is neceſſary. BY all theſe Names is intended an Opening or Inciſion made in the *Aſpera Arteria* or Windpipe; which is neceſſary in many Caſes, and eſpecially in (1) a violent Quinſey, to prevent Suffocation from the great Inflammation or Tumor of the Parts: (2) When a Bean, Pea, Plumb, or Cherry-ſtone, or ſome ſuch Bodies are ſlipt into the Trachea, and ſeem to threaten Suffocation: (3) And laſtly, this Operation may be practiſed upon People that have been lately drowned, and are not yet entirely ſuffocated, for by dividing the Trachea and inflating Air into the Lungs of ſuch Perſons ſeveral have been recovered. I am not altogether ignorant that many Phyſicians are averſe to this Operation, either eſteeming it dangerous, deadly, or inhumane: But thoſe Gentlemen are greatly miſtaken; for the ſmall Wound made in the Trachea by this Operation, is ſo far from killing, that even much larger, which are not made with this intention, are not to be judged mortal, as we intimated in treating of Wounds in this Part: So that we cannot help thinking with CASSBRIUS, that thoſe are both ignorant and timorous, who raſhly neglect this ſafe, eaſy, and often ſalutary Operation in the forementioned Caſes.

The Manner of extracting Bodies out of the *Trachea*. II. When this Operation is to be performed, the moſt convenient Part of the *Trachea* to be opened, is between the ſecond and third of its annular Cartilages; though it may be alſo opened much lower without Danger. The Method of proceeding, eſpecially when any Stone, Bean, Pea, or the like, are to be

be extracted, take as follows. In the firſt Place, the Patient is to be inclined backward upon a Bed or in a Chair, and his Head held firm by an Aſſiſtant, who is to ſtand at his Back; then the Skin, Fat, and Muſcles, are to be divided by making a longitudinal Inciſion with a Scalpell according to the length of the *Trachea*, beginning about two Fingers breadth below the Scutiform Cartilage, and continuing it for the Space of two, three, and in tall People four Fingers breadth. See *Tab.* XXI. *Fig.* 14. AA. Then the Sides of the Wound are to be drawn aſunder by an Aſſiſtant, either with proper Hooks or his Fingers, and after wiping off the Blood with a Lint or a Sponge to render the *Trachea* conſpicuous, three or four of its annular Cartilages are to be divided in a right Line; by which Means the Body lodged in its Cavity may be found by ſearching with a Probe, and afterwards extracted by a Hook or Pliers. When the Operation is finiſhed, the Wound is to be cleanſed with a Sponge, and dreſſed with ſome ſticking Plaſter, retained by Compreſs and Bandage; and afterwards it may be treated with ſome vulnerary Balſam, as mentioned in our treating of Wounds in this Part: And by theſe Means I happily extracted a Piece of a boiled Muſhroom, which ſlipped into the *Trachea* of a jocoſe Man at *Helmſtadt*, with Danger of Suffocation by Laughing, while he was eating Broth, in which Muſhrooms were boiled. By the ſame Method RAVIUS told me he happily extracted a Bean which had fallen into the *Trachea*; notwithſtanding the reſt of our modern Surgeons are negligent on this Head. Some Surgeons adviſe that kind of Suture which is uſed in the Hare-lip for the more ſpeedy and uniform Cicatriſation of the Wound in this Part; but in my Opinion that Apparatus may be properly omitted, as it uſually gives great Pain and Uneaſineſs to the Patient, and as the Wound may be cured by a Treatment much milder and equally ſafe.

How *Bronchotomy* ſhould be performed in a Quinſey.

III. When repeated Bleeding and the Uſe of proper Medicines take no Effect in a Quinſey, this Operation may be neceſſary to prevent the Patient from being ſuffocated. In this Diſorder there are three Ways of performing *Bronchotomy*, each of which we ſhall deſcribe in order. The firſt is by placing the Patient in a ſupine Poſture, his Head being held firm by an Aſſiſtant, as before; the Surgeon proceeding to make an Inciſion in the Integuments to the *Trachea*, or the Skin may be elevated by the Surgeon and an Aſſiſtant, and afterwards divided longitudinally together with the Fat and Muſcles which cover the *Trachea*. Some adviſe theſe Muſcles to be cautiouſly ſeparated from the *Trachea* or from each other; but that is not neceſſary, and theſe Muſcles may be ſafely inciſed without Danger. When the Integuments have been divided, the Wound is to be cleanſed, and the Blood ſtopped with a Sponge which has been dipt in warm Wine or its Spirit, while the Aſſiſtant draws one Side of the Wound from the other, with Hooks or his Fingers. Then the Surgeon makes an Inciſion with his Scalpell between two of the annular Cartilages, or elſe, as I have ſometimes ſeen, by dividing one of the Cartilages in the Middle, at the ſame Time; after which he may eaſily introduce a ſmall round or flat Tube of Silver or Lead, as we have repreſented in *Tab.* II. *Litt.* T U X. But before the Surgeon withdraws his Knife out of the Inciſion, it may be proper for him to inſert a Probe by the Side of it, by which Means he may afterwards more eaſily introduce the Cannula; which Cannula or Tube is to be faſtened to the Neck with a Ligature paſſing through Rings or ſmall Holes

Holes in its Side, and held firm in its Place by a Piece of perforated Emplaſter, being careful that the End of the Tube does not touch the back Part of the *Trachea*, and occaſion a troubleſome Cough. But to prevent the external Cold and Duſt from injuring the Lungs, it may be proper to let the Air paſs through a Piece of Sponge in the Tube, which ſhould be frequently dipt into, and expreſſed out of warm Wine; or, as GARENGEOT adviſes, through a Piece of fine Lint, having a Piece of perforated Emplaſter behind it. This being performed, the Patient may be bled in the Arm, Foot, Neck, or under the Tongue, and Clyſters, Gargles, with a Cataplaſm under the Chin, cupping on the Sides of the Neck, with other Medicines proper in Quinſeys, ſhould be diligently applied, till the Patient either recovers his Reſpiration or wholly expires, one of which uſually happens within four Days after the Operation. When a free Reſpiration by the Mouth ſucceeds two or three Days after the Operation, which may be known by ſtopping the Orifice of the Tube with a Finger, it may be then taken out and the Wound afterwards dreſſed and treated as we before directed: But if the Difficulty of Reſpiration ſtill continues it ſhould be continued in its Place with the other Remedies, till Death or a free Reſpiration put a Period to the Experiment.

The 2d and 3d Way of performing this Operation.

IV. Another and more ready Way of opening the *Trachea* is by inſerting a double edged Scalpell at one and the ſame Time, through the Skin, Fat, Muſcles, and Trachea itſelf; after which a proper Tube may be introduced and retained as before, by which Method the Operation may not only be performed in a much ſhorter Time, but the Wound will be made much leſs and the ſooner healed. The third and laſt Method of *Bronchotomy* is by an Inſtrument conſiſting of a ſmall Tube, in which is contained a triangular Needle called a Trochar, repreſented in *Tab.* 21. *Fig.* 15, 16. This Inſtrument is ſo managed, as to paſs through the Middle of the *Trachea* by one puſh, and after drawing out the Needle from the Tube, the latter is left in the Wound till the Patient recovers. This Method much exceeds the reſt, as it may be more eaſily and expeditiouſly performed, and occaſions the leaſt Wound and Pain to the Patient. The Dreſſings, *&c.* are to be performed the ſame here as in the firſt.

The Operation ſhould be timely performed.

V. We muſt not here neglect to adviſe the Performance of this Operation in time, while there is ſufficient Strength and Hopes of the Patient's recovery; for when the Patient is ſpent, it is uſually performed in vain. We may alſo add, that it will be prudent to call in the Aſſiſtance of ſome eminent Phyſicians, before the Operation be undertaken, in dangerous Caſes: Otherwiſe the Surgeon might ſuffer in his Character, by the Declamations of thoſe ignorant of his Profeſſion; who from the Singularity of the Operation, may ſometimes, in unſucceſsful Caſes, give out that he has cut the Patient's Throat, or killed him.

The Method of recovering ſuch as have been drowned.

VI. If a drowned Perſon has but juſt expired, or not continued long under Water, the moſt certain and expeditious Way of recovering him will be by opening the Trachea with a Scalpell or ſuch other Inſtrument as is neareſt at hand, and afterwards to inflate or blow into his Lungs either with the naked Mouth (as delay is dangerous) or elſe with a Tube: For by this Means, if timely adminiſtered, the Breath and Life of a Perſon thus ſuffocated may be ſurprizingly reſtored, as DETHARDINGIUS, preſent Profeſſor of Phyſic at the *Hague*, has lately declared in a particular Diſſertation upon this Subject.

VII. As

VII. As this Operation is performed neither in the *Larynx* or *Bronchia*, but in the *Trachea* or *Aſpera Arteria*, it ought not to be called Bronchotomy or Laryngotomy, as it commonly is by the Generality of Phyſicians or Surgeons; but *Tracheotomy* from the *Trachea*. This Operation has been treated of in a particular Diſſertation by FRID. MONAVIUS and SCHACHERUS Profeſſor at *Lipſick*. JULIUS CASSERIUS has alſo treated and illuſtrated this Operation with elegant Figures in his Treatiſe *de Vocis Auditusque Organis*, p. m. 119. RENATUS MOREAU and TH. FIENUS have diſcourſed learnedly on this Operation, the firſt in his Epiſtle *de Laryngotomia* and the laſt in his Book of Surgery.

Concerning the true Name and Writers of this Operation.

CHAP. CIII.

Of ſtrumous or ſcrophulous TUMORS *and* BRONCHOCELE.

I. ALMOST any kind of Tumor which is formed in the anterior or lateral Parts of the Neck near the Skin is uſually denominated ſtrumous or ſcrophulous; though there is a great Variety and Difference in the Nature of theſe Tumors, ſome being ſmall, ſome of a moderate Size, and others ſo much inlarged as to cauſe Stupidity: Some are ſoft or moveable, others hard or immoveable; ſome of a mild Nature, and others of a malignant or cancerous Diſpoſition. But with regard to the Cauſe of theſe Tumors, they are uſually formed of indurated Glands in the Neck, as the ſmall moveable Glands, the ſuperior and inferior ſalival Glands, and ſometime the thyroide Glands, which are by ſome ſtrictly called Scrophulæ or the Evil, by the *French* Ecrouelles: Some of them are related to encyſted Tumors, and therefore contain a hard or ſofter Subſtance like Cheeſe, Suet, or Lard. But if a Tumor ariſes in the anterior Part of the Neck from the reſiſting Flatus or Air, ſome Humour, or other Violence, as ſtraining in Labour, lifting of Weights, *&c.* the Diſorder is then uſually called a Broncocele. It is remarkable, that ſome Nations are quite free from this Diſorder, while others are grievouſly afflicted therewith, among which latter we may reckon the Inhabitants of *Spain*, *Germany*, *Sweedland*, *Bavaria*, *France*, *Helvetia*, and eſpecially the Inhabitants of *Tirole*, who have theſe Tumors (but flaccid) ſometimes in ſuch a Degree, that they extend to their Navel, even down to their Knees; the Cauſe of which peculiarity, in the Spreading of this Diſorder among certain People, is ſuppoſed to reſide either in the Air or Waters of thoſe Countries; but in what Manner they operate to produce thoſe Effects has not yet been explained by phyſical Writers, though we are furniſhed with many ſpecious Conjectures and Opinions. Theſe Tumors riſe in various Parts of the Neck of ſome Women after a difficult Labour. There is another Difference in ſcrophulous Tumours, that ſome are milder and without any Pain, while others are inflamed, painful, or indurated, ſo as to be ſcirrous, and in ſome Meaſure cancerous, obſtructing the Office of Reſpiration and Deglution. But of what ever kind theſe Tumors are, when they are once become inveterate, they are very difficultly, if ever curable by Medicines; but if they are recent, they may be ſometimes diſperſed, eſpecially when the Tumor is from an Induration of the Glands. We are informed

Struma, what it is, and its cauſe.

informed, that the *French* and *Engliſh* Kings have poſſeſſed a very eaſy Method of curing this Diſorder, barely by touching the Parts affected: But we have not Opportunity at preſent, to enter minutely into this Matter; they who are deſirous of more may conſult LAURENTIUS in his Treatiſe *de mirabili Strumas ſanandi vi, ſolis Galliæ Regibus divinitus conceſſa*; as alſo JOHN BROWNE in his Treatiſe of ſtrumous Glands, where he vindicates the Right and Virtue of the regal Touch to belong to the Kings of *England*, adding many Examples for the Confirmation thereof.

Treatment of recent Strumæ.

II. In order to cure ſcrophulous Tumors of the recent Kind, nothing is more conducive than a proper Regimen of Diet and way of Living, eſpecially when aſſiſted with a good Air and the Uſe of internal Medicines, ſuch as Diſcutients, Attenuaters, and cooling Purges, ordered according to the Age and Conſtitution of the Patient, as we before adviſed at *Chap.* XCVIII. in treating of ſcirrous Glands in general, and particularly of the ſalival Glands; but the internal Means ſhould alſo be aſſiſted by a diſcutient Ointment externally, as

℞ *Merc. Crud.* ʒi. *Terebinth. Venet.* ʒii. *Sabacti, Axung. Porcinæ, quantum ſufficit pro Ung.*

This Ointment ſhould be rubbed in upon the Tumor every Day for a conſiderable Time, applying afterwards *Empl. de ranis cum Mercurio, de Cicutâ*, or *Diaſaponis*; but during the Uſe of theſe it will be proper to give the Patient a gentle Purge once a Week, to prevent the Mercury from cauſing a Salivation. SCULTETUS and FABRICIUS AB AQUAPENDENTE greatly extol the following Ointment in this Diſorder.

℞ *Ol. Laurin.* ʒi. *Alumin. Rupe.* ʒſs. *Sal. commun.* ʒii. *m. f. Ung.*

Inſtead of which, others uſe the *Ol. Philoſoph.* or *Petrolium alb.* either alone or mixed with *Ol. Sapon.* There are alſo good Effects promiſed from wearing a leaden Collar that has been mixed with Mercury, eſpecially when the ſcrophulous Tumor or Bronchocele are recent, at leaſt it prevents them from growing bigger, if it does not entirely diſperſe them. There are ſome who adviſe to rub the Tumors well with the Hand or a Bone of a dead Man, and others direct to more ſuperſtitious Means, which they ſuppoſe to act by Sympathy, but we muſt frankly own, our Opinion is, there can be little or nothing in ſuch a Practice.

Treatment of inveterate Strumæ.

III. If the ſtrumous or ſcrophulous Tumor is of long ſtanding, but moveable, it may be then better removed by the Knife than by Medicines; the moveable Tumors of this Kind may be extirpated by the Scalpell, while thoſe which are fixed and lie deep in the Neck, cannot be ſafely removed without Prejudice to the Patient, unleſs they happen to be of the ſofter Kind. In extirpating theſe Strumæ or Scrophulæ, there is no ſmall Danger of wounding ſome of the large Arteries, Veins, or Nerves of the Neck by the Scalpell, which would occaſion Death or ſome very bad Symptom. GARENGEOT and PETEIT affirm that no ſcirrhous or indurated Glands detach any Roots into the adjacent Parts, notwithſtanding they appear to be fixed or immoveable, and that therefore the immoveable Kind of Strumæ may be ſafely extirpated, but as they produce no Inſtances of Succeſs from this Opinion, there is no doubt but it will be rejected as precarious by the Generality of prudent Surgeons. For the Extirpation of moveable

moveable Strumæ there are three Methods chiefly in uſe, the firſt of which is by Ligature, when the ſtrumous Tumor hangs by a ſlender Part like a Stalk, which is not very frequent; but if the Tumor is not pendulous, or if it be connected by a large Root, it is then to be removed by the ſecond Method with a Scalpell; in order to which a crucial Inciſion is to be made upon the Middle of the Tumor down to its proper Integument, and then the wounded Parts are to be ſeparated by the Knife from the Tumor, which is to be afterwards taken hold of by a Hook, Needle, and Thread, or a convenient Pair of Pliers, and by that Means taken out as we have directed before, in treating of encyſted Tumors. During the Operation an Aſſiſtant is to dry up the Blood from the Orifice of the Wound, by repeated Applications of Lint or Sponge, that the Surgeon may have a clear View of his Work; and if by Accident a large Blood-veſſel ſhould be divided with the Root of the Tumor, it is to be cloſed by applying *Sp^t. Vin. Rect.* or ſome ſtyptic and aſtringent Medicine, and if theſe fail, a Ligature or actual Cautery. And laſtly, the divided Parts of the Skin are to be brought cloſe to each other by a Piece of ſticking Plaſter, and placed uniform, ſo as to unite without leaving a diſagreeable Cicatrix, and the Remainder of the Treatment may be conducted as in other Wounds. I have ſeveral Times opened ſome of the ſofter Strumæ or Scrophulæ either with a Scalpell or Cauſtic, and after diſcharging their Contents and cleanſing the Ulcer, have performed the reſt of the Cure as in other Wounds. As theſe Tumors are uſually without Pain, it is not at all ſurprizing that they ſhould be neglected by the Generality of People, who are both poor, careleſs, and fearful of the Surgeon's hand; and that more eſpecially if they think the Tumor an Ornament, like the Inhabitants of *Tyrole*. If a Patient ſhould be deſirous of being freed from this Diſorder without the Knife, it may be done with Cauſtics; as we have directed in Tubercles and Excreſcencies: Being at the ſame Time careful not to undertake this Method of Cure, in any but the more ſoft and mild kind of Strumæ, ſeated not near any large Veſſel nor too deep in the Neck, otherwiſe the Tumor may be converted from a ſtrumous to a cancerous Diſpoſition, or at leaſt malignant Symptoms brought on, which would endanger the Patient's Life, by injuring the large Veins, Arteries, Nerves, or Trachea, ſeated in thoſe Parts.

CHAP. CIV.

Of SETONS.

I. A Seton is a few Horſe-hairs, ſmall Threads, or a larger Packthread, drawn through the Skin, chiefly of the Neck, by Means of a large Needle or Probe, with a View to reſtore or preſerve Health. There are chiefly three Methods of performing this Operation practiſed by Surgeons. The firſt is by taking up the Skin in the lower Part of the Neck, while an Aſſiſtant draws it tight about an Inch above, then the Surgeon paſſes through the Skin a large and crooked Needle (*Tab.* XVIII. *Fig.* 12. or XXII. *Fig.* 9.) armed with Silk or Thread, either twiſted together into a large String, or in 20 or 30 ſmall and looſe Threads, which being drawn through the Skin are to

1ſt Way of making a Seton.

be left in the Neck after the Needle has been removed (*Tab.* XXI. *Fig.* 17.) The Wound is then dreſſed with ſome digeſtive Ointment, and covered with a Piece of Plaſter, perforated on each Side for the Ligature to paſs through, and thus the Seton is decently compleated. The Name ſeems to be derived from *Seti Equini*, or Horſe-hairs; which were by the Ancients uſed inſtead of Thread: But our modern Surgeons changed them for Thread of Silk or Flax, which are much more eaſy to the Patient. The Ligature is to be ſhifted or drawn through the Wound a little every Day, and the Matter is to be wiped off every Morning and Night as in Iſſues; by which Means it will degenerate into an Ulcer with a double Orifice, making a copious Diſcharge daily, and when one Ligature is become foul and unfit for Uſe, a freſh one may be introduced by faſtening it to the End of the old, which may be then drawn out.

2d Method. II. The 2d Way of making a Seton differs little from the former, only inſtead of a large Needle a double edged Scalpell or Launcet is made uſe of (*Tab.* I. *Lit.* B or I) and having faſtened the Ligature to a Probe, it is thereby to be introduced through the Wound, by which Means a larger Aperture is made with a Knife than with a Needle, and a larger Quantity of Matter thereby diſcharged. One of the beſt Inſtruments for this Operation is exhibited in *Tab.* XXIII. *Fig.* 5. which ſhould be fitted with a Handle, and after it has been forced through the Skin to the Part B, and the Ligature drawn out of the Aperture or Eye marked A; it may be again drawn back out of the Wound, leaving the Ligature behind.

3d Method. III. The 3d Manner of performing this Operation is by an Inſtrument for the Purpoſe, deſcribed and repreſented by HILDANUS, FABRIC. *ab Aquapendente*, SCULTETUS, and others, by which the Skin is pinched up, and afterwards perforated with a ſharp pointed and red-hot Iron, after which a Ligature is introduced as before. As this Operation is attended with great Pain and conſequent Suppuration; it is not at all ſurprizing that it ſhould be approved of by many eminent Phyſicians, to make a ſtrong Revulſion and copious Diſcharge of offending Humours from the Head, Eyes, and more noble Parts.

Setons ſometimes made longitudinally. IV. Some have been and are of Opinion that a Seton made longitudinally according to the Length of the Neck, is much more efficacious than the tranſverſe; but I could never obſerve any material Difference, though I have ſometimes deſignedly uſed this Way of operating, in which I always found much more difficulty, becauſe the Skin cannot be ſo eaſily taken up, nor the Scalpell or Needle introduced in the longitudinal, as it may in the tranſverſe Direction. In this Method, the Head is to be inclined backward, the Skin taken up, and perforated by a very crooked Needle (*Tab.* XXII. *Fig.* 9.) which may be done better by holding the Skin up with a Pair of Pliers rather than the Fingers, eſpecially thoſe made for the Polypus (*Tab.* XIX. *Fig.* 10.) being perforated with an oblong Aperture near the Extremity of their Mouth.

The Uſe of Setons. V. There are many Phyſicians and Surgeons who eſteem Setons to be of little Conſequence in the Cure of Diſorders, eſpecially DIONIS and GARENGEOT; whereas others, on the contrary, propoſe it to be one of the beſt Means of relieving many chronical and obſtinate Diſorders, particularly thoſe of the Head; ſuch as Drowſineſs, Head-achs, Epilepſy, and Diſorders of the Eyes: And as it is certain many ſuperfluous and pernicious Humours may be drawn from

from the Parts affected, and be this Way diſcharged, we need not wonder that a Seton ſhould be preferred by many Phyſicians as more effectual than a Pair of Iſſues. We alſo find by Experience, that they are very uſeful in the Hydrocephalus, Catarrhs, Inflammation, and other Diſorders of the Eyes, Gutta Serena, Cataract, and incipient Suffuſion, to which we may add intenſe Head-achs, with Stupidity, Drowſineſs, Epilepſies, and even the Apoplexy itſelf: But as Setons are uſually attended with much Uneaſineſs and Trouble, their good Effects are but ſeldom experienced by Patients in thoſe Diſorders.

PART II. SECT. IV.

Of Diſorders of the THORAX, *coming under the Province of Surgery.*

CHAP. CV.

The manner in which the Nipples of the BREASTS *in Women may be drawn out, extended, and milked.*

I. THE Nipples of ſome young Women who have never lain in before, are frequently ſo ſmall and ſunk into the Breaſts, that the new-born Infant cannot lay hold of them, ſo as to ſuck out the Milk. In this Caſe, it may be neceſſary to apply an Infant that can draw much ſtronger, or has been uſed to ſuck, or elſe an adult Perſon, who is expert in this Practice; but if neither of theſe can be conveniently obtained, and the Infant does not draw out the proper Quantity of the Milk, it may be then more decent as well as convenient to apply an Inſtrument adapted to this Purpoſe, ſuch as, 1. a Sort of Glaſs repreſented in XXI. *Fig.* 18. the larger Part of which marked A, is to be applied like a Cupping-glaſs upon the Nipple, and the Tube BB is to be ſucked in the Patient's own Mouth: And this ſhould be repeated till the Nipples are ſo much extended, as to be eaſily taken hold of and ſucked by the Infant. 2. If none of thoſe Glaſſes are at hand, the ſame Intention may be anſwered by applying a Tobacco-pipe in like manner. 3. Others apply a ſmall Cucurbite made of Ivory or Alabaſter in the Form of a Hat, as at *Fig.* 10. which they ſuck ſtrongly in their Mouth. 4. I have by me another Sort of Glaſs, which may be called a ſucking Glaſs, repreſented at *Fig.* 20. this being made hot with warm Water, or holding it before a Fire, ſo as to rarify and expel the Air, and its Mouth A applied over the Nipple it will be not only extended or drawn out, but will alſo diſcharge a conſiderable Quantity of Milk, which will take down the Inflammation and Tumor of the Patient's Breaſt. When the ſucking Power of the Glaſs is grown very weak, the Milk may be let out at the Aperture B which was before ſtopped up with Wax; and after heating the Glaſs again, as in Cupping, ſtopping up the Hole again with Wax, it may be applied ſucceſſively as long as may be requiſite. Laſtly, young Welps, who have not yet any Teeth, have by ſome been applied with Succeſs for the ſame Intention.

CHAP. CVI.

Of chapp'd and ſore NIPPLES.

IT is a common Calamity of lying-in Women, who ſuckle their own Children, to be troubled with Fiſſures and Ulcerations in their Nipples, attended with great Pains, which will receive the moſt Benefit from the Application of *Mucilag. ex Sem. Cydon.* or a Mixture of *Ol. Ovar. & Ceræ*; or laſtly, a fine Powder of *Gum. Tragacanth.* which may be ſprinkled on through a Piece of Muſlin, as there may be occaſion; but then the Infant ſhould ſuck the ſore Nipple as ſeldom as poſſible, that it may heal without Interruption, and the Shift or Linnen ſhould be alſo kept from adhering to it; in order to which, when the Infant has done Sucking, the Nipple may be waſhed in a Solution of *Sacch. Saturn. in aq. Plantag.* defending it afterwards with a Cap of Ivory, Marble, or White-wax, like that in *Tab.* XXI. *Fig.* 19.

An EXPLANATION *of the* TWENTY FIRST PLATE.

Fig. 1. Repreſents the Manner of dividing the Frenulum of the Tongue in Infants, by the Scalpell.

Fig. 2. Shews how the ſame is to be done with a Kind of Fork and Pair of Sciſſors.

Fig. 3. Is the Fork itſelf, in its true Size, to hold up the Tongue in that Operation.

Fig. 4. and 5. Are thin Plates of Gold or Silver to ſupply the Loſs of any Part of the Palate-bones, having a Piece of ſoft Sponge faſtened to them in the Part a a.

Fig. 6. Repreſents the braſs Inſtrument of HILDANUS, to take off the Uvula by Ligature; AA is the Thread or Ligature properly diſpoſed and faſtened in the Inſtrument; B, the Part which takes hold of the Uvula; C, that Part of the String to be drawn by the Hand: But the Inſtrument itſelf is figured three Fingers breadth leſs than it really is.

Fig. 7. Is a braſs or ſteel Wire furniſhed with an Aperture A, to convey the String through the preceding Inſtrument, to the Size of which it ſhould be proportioned. B, its Handle.

Fig. 8. Repreſents an Inſtrument to make an Abciſion of the Uvula: A, the Part which is to receive the Uvula; BB, the Handle by which the Scalpell C is thruſt forward to cut off the Uvula; DDD, is the Handle of the whole Inſtrument to be held in the left Hand.

Fig. 9. Is an Inſtrument that may be called *Pariſthmiotomus*, ſerving to ſcarify the Tonſils when inflamed, or open them when ſuppurated; A, the concealed Scarificator; B, the Handle by which it is to be moved in that Work; C, the Handle by which the Inſtrument is to be held firm in the Operation.

Fig. 10. Is a Probang or long Probe of Whalebone marked BB, armed with an oily Sponge AA, to remove ſmall Bones or Splinters out of the Gula.

Fig. 11. Is a Scowering-bruſh for the Stomach: AA, the Bruſh-part, of fine Hairs; BBB, the Handle of twiſted Braſs-wire, covered with Silk, by which it is to be introduced into the Stomach.

Fig.

Fig.1.

Fig.2.

Fig.4.

Fig.5.

Fig.15.

Fig.16.

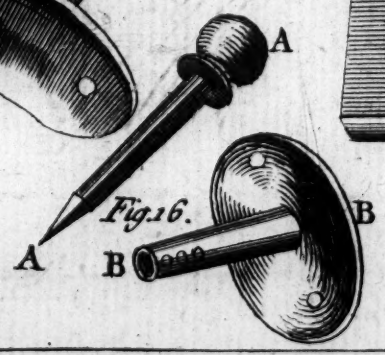


Fig.3.

Fig.6.

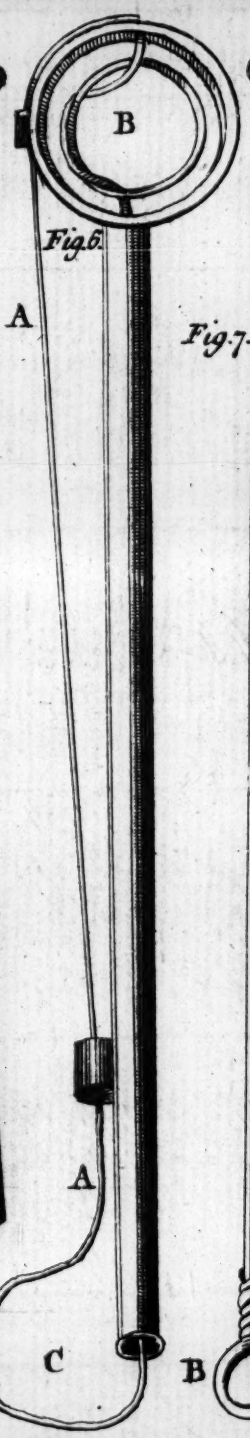


Fig.7.

Fig.9.

Fig.8.

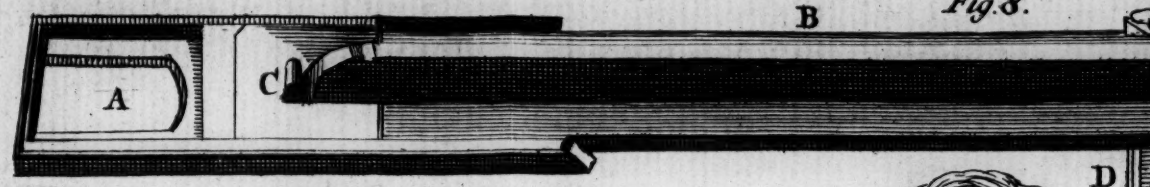


Fig.10.

Fig.12.

Fig.18.

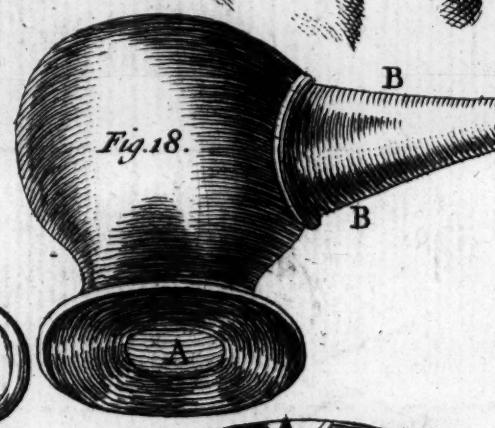
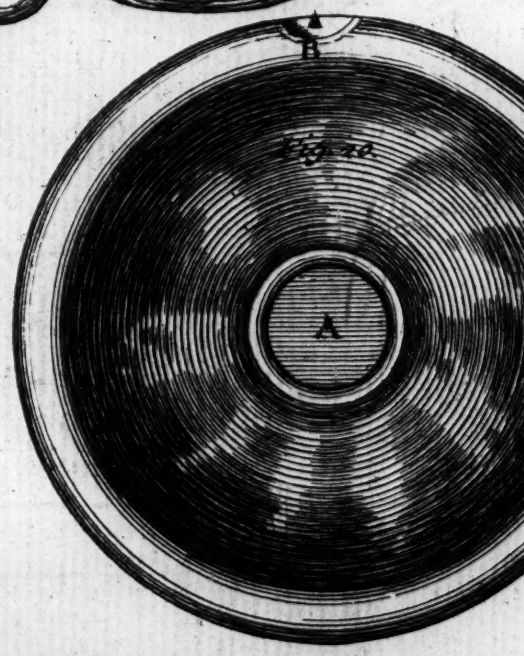


Fig.20.



g. 10.

Fig. 17.

Fig. 19.

J. Mynde sc.

Fig. 12. Exhibits the wry Neck: AA, the two maſtoide Muſcles, which are to be divided in their lower Part, when preternaturally contracted.

Fig. 13. Repreſents an Inſtrument to ſtraighten the wry Neck: A, the Collar lined with Fur, to be put about the Neck; BB, an iron Arch furniſhed with the Ring, C, by which the Patient is to be ſuſpended.

Fig. 14. Exhibits the Part and Manner of dividing the Integuments in *Tracheotomy*.

Fig. 15. Repreſents a kind of Trocar to perforate the *Aſpera Arteria* in Bronchotomy.

Fig. 16. Is another of thoſe Inſtruments contrived by *Dekkerus*: AA, the Bodkin, whoſe Point coming through the Tube introduces it into the Trachea, where it is left, after the Bodkin is extracted.

Fig. 17. Denotes the Part of the Neck for the tranſverſe Seton.

Fig. 18. Is a Glaſs-inſtrument, whoſe Bowl A being applied upon the Nipple, and the Tube BB in the Patient's Mouth, the Nipple and Milk may be drawn out.

Fig. 19. Is a little Cucurbite of Ivory or Alabaſter to draw out ſmall Nipples and cover them when excoriated.

Fig. 20. Is a ſucking Glaſs to draw out the Milk, by rarifying the internal Air with Heat.

CHAP. CVII.

Of a Cancer in the BREASTS.

The Deſign of this Chapter.

I. WE have before obſerved (in *Part* I. *Book* IV. *Chap.* IV.) that the Breaſts, eſpecially thoſe of Women, are not only ſubject to Inflammation and Ulceration, but alſo to become ſcirrhous and cancerous: But how the firſt are to be treated we have before declared in the Place now mentioned; we have alſo explained (in *Part* I. *Book* IV. *Chap.* XVII.) the Cauſes which may produce a Cancer, the Manner of its Increaſe, with its conſequent Symptoms and diagnoſtic Signs, together with the Medicines proper through the whole Courſe of the Diſorder; it therefore now remains to deſcribe the Operation, by which a cancerous Breaſt is to be extirpated, when other Medicines have no Effect.

The Manner of extirpating a latent Cancer, not yet ſpread thro' the Breaſt.

II. Before we proceed to an Operation ſo important, it may be firſt neceſſary to enquire whether the adjacent axillary Glands are indurated only, or whether they are infected, and communicate with the Cancer; for in that Caſe, extirpating the Breaſt will not cure the Patient: But the Virus of the Cancer, which lies concealed in the other Parts, will make the ſame Diſorder break out again in a ſhort Time. Though there are ſome Inſtances where the axillary Glands have been indurated, and the Patient cured of the Cancer by extirpating thoſe Glands together with the Breaſt. Before the Surgeon proceeds to this Operation, he ſhould firſt prepare his Patient for it by a proper Diet and Way of Living, that the Cancer may not be too large and immoveable; and when he finds it in that Condition, occupying but one Part of the Breaſt, as in *Tab.* XXII. *Fig.* I. AB, the Patient ſhould then be placed in a high Chair, and

and the Arm belonging to the affected Breaſt ſhould be either held downward and backward extended, or faſtened to the Chair in that Poſture, with a Ligature, by which Means the pectoral Muſcle will be flatened or expanded, and more eaſily ſeparated from the diſordered Part of the Breaſt. It is then the Practice of many, to make a large crucial Inciſion upon the Integuments of the Cancer, which being carefully ſeparated by the Scalpell, and the Cancer freed from the ſound Parts on every Side is then extracted, which may be done commodiouſly by paſſing a large Needle *Tab.* VI. *Fig.* 5, 6. armed with a Ligature; or the diſordered Part may be elevated by a Hook only, repreſented in *Tab.* VIII. *Fig.* 2, 3. For my own Part, I have often extirpated Cancers bigger than one's Fiſt, which have extended from the Nipple to the Shoulder, in the Manner repreſented by *Tab.* XXII. *Fig.* 1. AB, which have been cut off, by no other Inſtrument than the Scalpell *Tab.* XII. *Fig.* 14. in a ſtraight Direction; and after an exact Separation of the Morbid from the ſound Parts, the Wound has been healed in the Manner exhibited by *Tab.* XXII. *Fig.* 2. but where the Integuments are alſo affected and ſtrictly joined to the Cancer, there will be little Room to expect a perfect Cure, if they are not both cleanly extirpated together.

What is to be done after the Operation.

III. Immediately after the Operation, it may be convenient to let the Wound bleed a few Ounces according to the Strength of the Patient, if they are not of a weak and infirm Habit, which may prevent a freſh Hæmorrhage, Inflammation, or Fever. Nor is it neceſſary to apply an actual Cautery to ſtop the Hæmorrhage in this Operation, as the Ancients were of Opinion; it may be ſufficient only to tie up the larger Veſſels, and to apply a large Quantity of ſcraped Lint, retaining it with a thick and broad Compreſs and a long Bandage, though my quondam Preceptor BIDLOW, who was well verſed in theſe Operations, adviſes to ſprinkle fine Powder of Plaiſter of Paris upon the Lint to ſtop the Hæmorrhage; others adviſe ſtyptic Powders, or taking up the larger Arteries with a Needle and Thread; but GARENGEOT aſſerts, ſowing up the Lips of the recent Wound immediately after the Operation, as the celebrated PETIT propoſes, to be not only the ſafeſt Method of ſtopping the Hæmorrhage, but alſo the moſt expeditious Way of healing the Wound, and preventing a Return of the Cancer, without the Uſe of Lint, Styptics, or other Medicines; but a Cancer, which I extirpated in this Manner, which I let bleed a conſiderable Quantity after the Operation, was indeed ſoon healed, but then it returned ſoon after, and the Patient expired of a Cancer, which broke out ſeveral Times in the old Seat. I therefore think it very neceſſary to be provided not only with Lint, but alſo *Alcohol Vini* and ſtyptic Powder of Bole, *Sang. Dracon. Colophon. & Maſtich.* to be applied with ſcraped Lint and Puff-ball, in ſuch Caſes, where the Hemorrhage is violent, and eſpecially when the Patient is weak and infirm, proceeding immediately to the Dreſſing without loſing much Blood; and the Remainder of the Treatment is to be managed at each dreſſing, as we before have directed in treating of Wounds in general. I have ſometimes experienced the Benefit of a large thick Compreſs dipt in warm Ale and Butter, to ſuppreſs the Inflammation in the firſt Dreſſing, as HELVETIUS adviſes; though other Caſes have ſucceeded as well, in which all the Compreſſes were applied dry.

When the whole Breaſt is to be taken off in Cancers.

IV. If the whole Breaſt is become ſcirrhous or cancerous, whether it be latent and intire, or ulcerated, it ought to be extirpated with all the Parts of the Breaſt. And here the Surgeon ſhould conſider before the Operation, as we before adviſed, whether the Cancer has any Communication with the axillary Glands, or whether it adheres to the pectoral Muſcle; in either of which Caſes Authors generally aſſert the Operation to be uſeleſs. But ſome of theſe Cancers have been cured by extirpating thoſe Glands, as we intimated before, at *N°* II. to which we may add, that BIDLOW aſſerts, he has happily ſucceeded in ſuch Cancers, where part of the pectoral Muſcle has been alſo affected and extirpated; where he alſo affirms, the Caſe to be not abſolutely deſperate, even if the Cancer has infected the Ribs with a Caries, which I have alſo experienced myſelf, more than once, having cured ſuch a Caries with the Raſpitory and *Ung. fuſc. Wurtzii*, but if the Cancer has no Communication with the axillary Glands or pectoral Muſcle, there is much more Hopes of ſucceeding in the Cure.

The Manner of operating.

V. When the whole Breaſt is therefore become cancerous, and to be totally extirpated, the principal Ways of performing the Operation are (1) by placing the Patient in a proper Seat; and according to SCULTETUS, to paſs a large Needle (*Tab.* XVIII. *Fig.* 12.) armed with a ſtrong Thread or Cord, which is to be drawn through the Bottom of the cancerous Breaſt; the Extremities of the Cord or Ligature are to be afterwards faſtened together, ſo as to elevate the Breaſt, and if one Ligature be not ſufficient, a ſecond may be introduced in a croſs Direction to the former, as in *Tab.* XXII. *Fig.* 4, 5. by which Means the diſordered Parts may be cleanly extirpated, by drawing them, in all Directions, towards the Knife, as well upward, repreſented in *Fig.* 5. as downward, according to SCULTETUS, *Tab.* XXXVI. The Knife uſed in the Operation ſhould be larger or ſmaller, in proportion to the Breaſt. The 2d Way of performing the Operation, practiſed by SOLINGEN and BIDLOW, differs chiefly from the former in the Uſe of a large Fork (*Fig.* 6.) inſtead of the Ligatures, which is thruſt into the Bottom of the cancerous Breaſt, that by making a ſtrong Elevation the Knife (*Fig.* 7.) may be paſſed beneath it. But if the Cancer be ſmall, BIDLOW uſes a ſingle Inſtrument (*Fig.* 8.) like a ſmall Sword, to perform the Elevation inſtead of the Fork; each of which Inſtruments ſhould be fitted with Handles. But (3) as theſe Methods of operating have been thought too formidable and ſevere by our modern Surgeons, HELVETIUS has endeavoured to effect the ſame, by contriving Pliers inſtead of a Fork, one of which (*Tab.* XXIII. *Fig.* 1.) holds up the diſordered Breaſt by its two Points, AA, the other (*Fig.* 2.) ſqueezes up the whole Breaſt between its Sides, AB, by which Means it may be commodiouſly elevated, and evenly divided by a large Knife. The (4) and laſt, and in my Opinion, the beſt Way of operating, is, when the Surgeon uſes no other Inſtrument but the Knife, whilſt he elevates the diſordered Breaſt with his other Hand; and if the Breaſt ſhould be ſo much inlarged, that the Surgeon cannot contain it in one Hand, an Aſſiſtant may elevate it with both; and in this Method I extirpated that large cancerous Breaſt (*Tab.* XXII. *Fig.* 3.) which weighed a dozen Pound, both expeditiouſly and ſucceſsfully. See more Examples in SCULTETUS, *Obſ.* 44.

An EXPLANATION *of the* TWENTY SECOND PLATE.

Fig. 1. AB, exhibits a latent or occult Cancer, occupying but Part of the Breaſt, from the Nipple towards the Shoulder.

Fig. 2. Repreſents the ſimple and rectilinear Cicatrix, left after the Cure of the former.

Fig. 3. AB, denotes a large Cancer, not yet broke, but ſpread through the whole Breaſt: It weighed 12 Pounds, after I had extirpated it with nothing but the Knife and my Hands.

Fig. 4. Shews the Method formerly practiſed to extirpate a Cancer by elevating with large Needles, bb, armed with ſtrong Threads, cc.

Fig. 5. Repreſents the Manner of faſtening the preceding Threads, in the Hand, A, to elevate and amputate the Cancer, with the long Knife, B.

Fig. 6. Is a Fork propoſed by SOLINGEN and BIDLOW, to elevate the Breaſt in amputating Cancers.

Fig. 7. Is a large amputating Knife, for this Operation.

Fig. 8. Is the ſingle Fork of BIDLOW, like a Sword, for elevating cancer'd Breaſts.

Fig. 9. Is a large and broad crooked Needle; with a Groove near its Eye, B, to receive the Ligature: The Part B may be faſtened in a Handle, that it may be more eaſily paſſed through the Breaſt.

Fig. 10. Repreſents the Point of the Needle in its true Size, viewed on the internal or concave Surface.

A new Method of extirpating Cancers.

VI. The neweſt Method of performing this Operation, which was contrived a few Years ago by a *Dutch* Surgeon, but made public in a Diſſertation, together with the Inſtrument (*Tab.* XXIII. *Fig.* 3.) by my Friend D. TABOR, a Phyſician, conſiſts in placing the Breaſt between the two Arches of the Inſtrument *Fig.* 3. marked AA BB. Theſe Arches are to be cloſed with the left Hand by the Handles CC, *Fig.* 3. in the Manner repreſented at *Fig.* 4. ſo as to elevate the cancerous Breaſt, which is afterwards to be cut off by a ſharp Knife, in the Form of an Arch marked EF, faſtened by the Screw G, and to be moved over or acroſs the other Arch, DD; but though this is an ingenious Inſtrument, and worthy to be taken notice of, we cannot help thinking that the ſimple Method of operating before deſcribed at *N°* 5. is much more preferable; yet we were unwilling to omit furniſhing our Readers with this new Method and Inſtrument, which will be explained more at large in the References to *Tab.* XXIII. following.

What is to be done after the Operation.

VII. When the Breaſt has been taken off any of the forementioned Ways, it may be proper to let it bleed a little before it is dreſſed; not ſo much to diſcharge the cancerous and infected Blood, as ſome imagine, as to prevent a future Hæmorrhage and Inflammation: Which may however be omitted in caſe of Weakneſs; and then dreſſed as we have directed at *N°* 3. Only we are to obſerve this Admonition, that the Dreſſings are not to be taken off before the third Day; nor even then ſhould any of the Lint be pulled off, till it falls off of its own Accord: And the ſeldomer or more tenderly the Dreſſings are made, the more kindly and ſpeedily does it uſually heal; but when there is a copious

Diſcharge

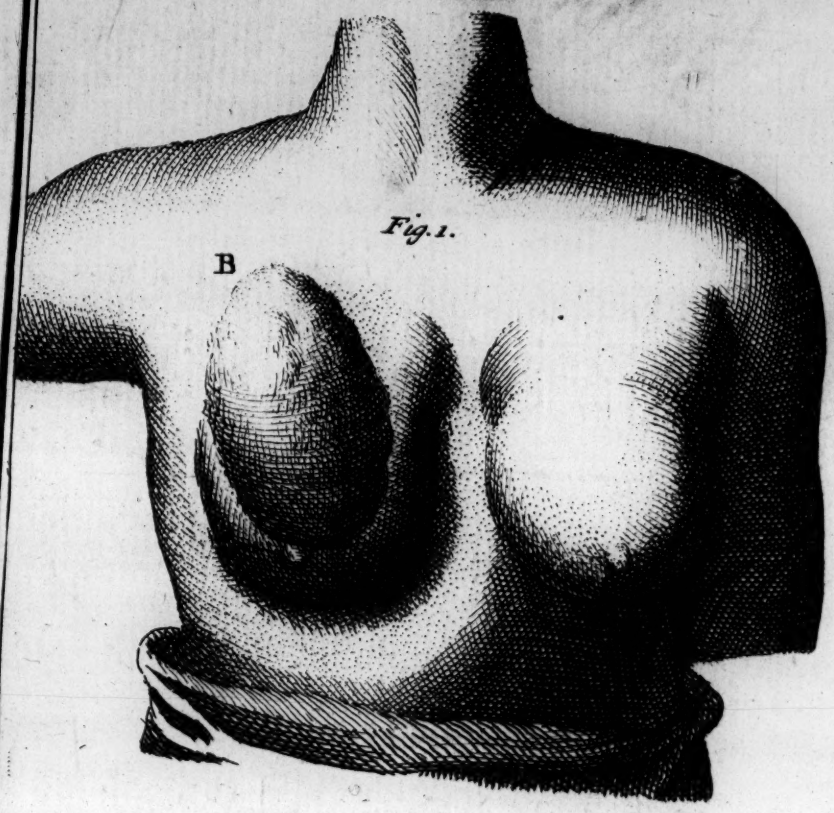
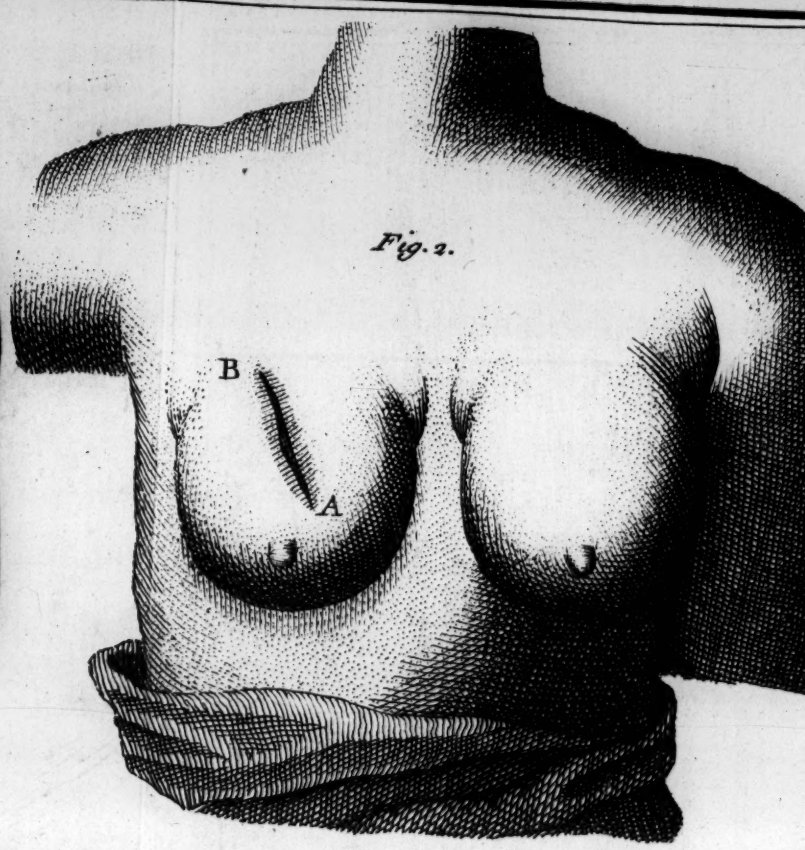


Fig. 1.



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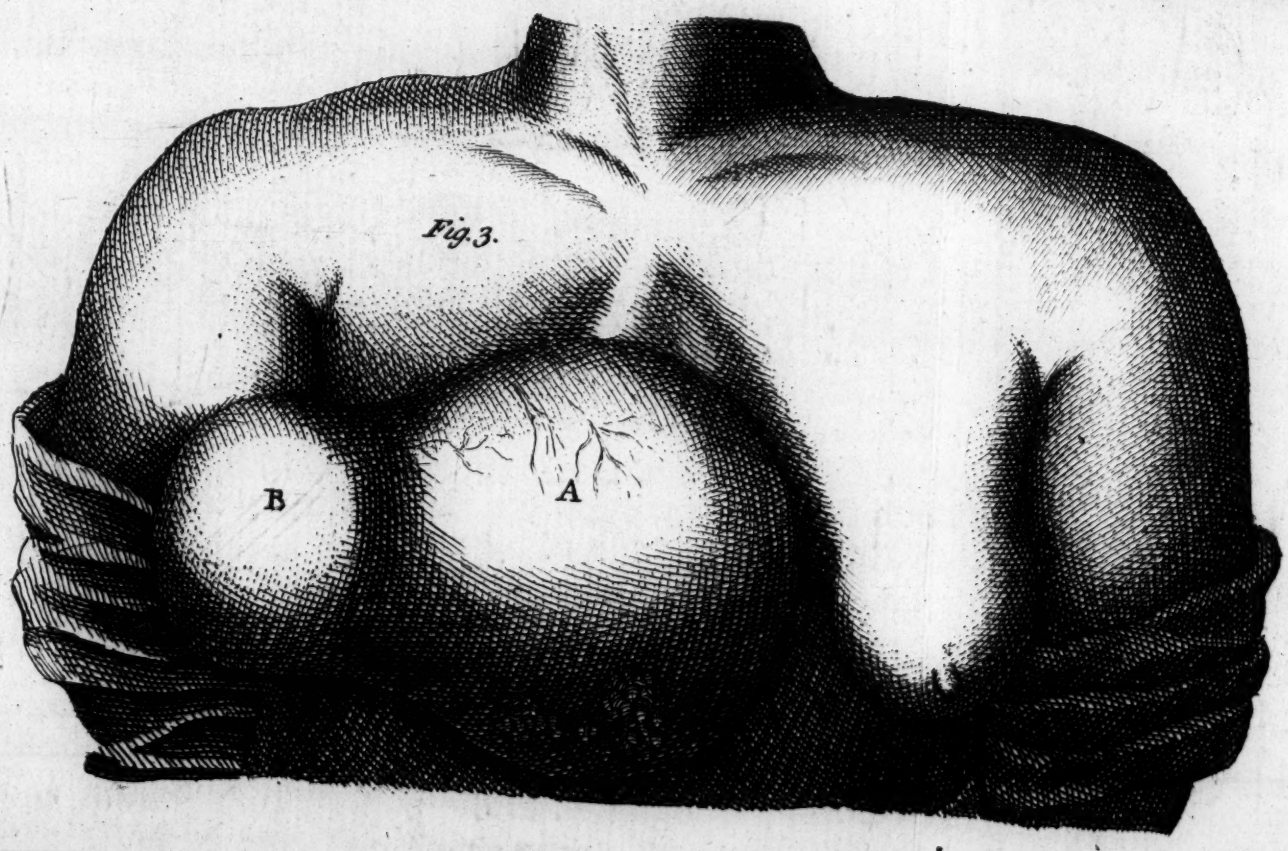
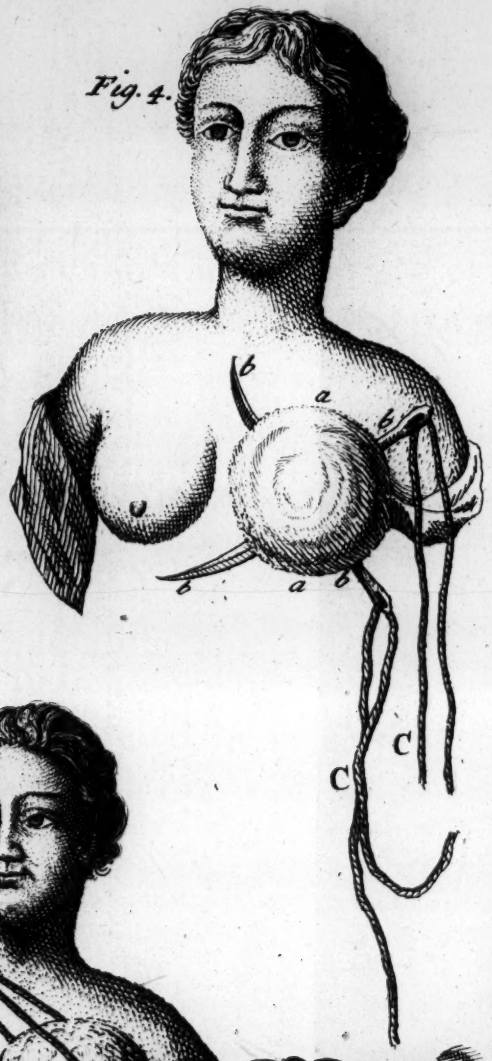


Fig. 3.

Fig. 5.

Fig. 4.



B

Fig. 9.

Fig. 6.

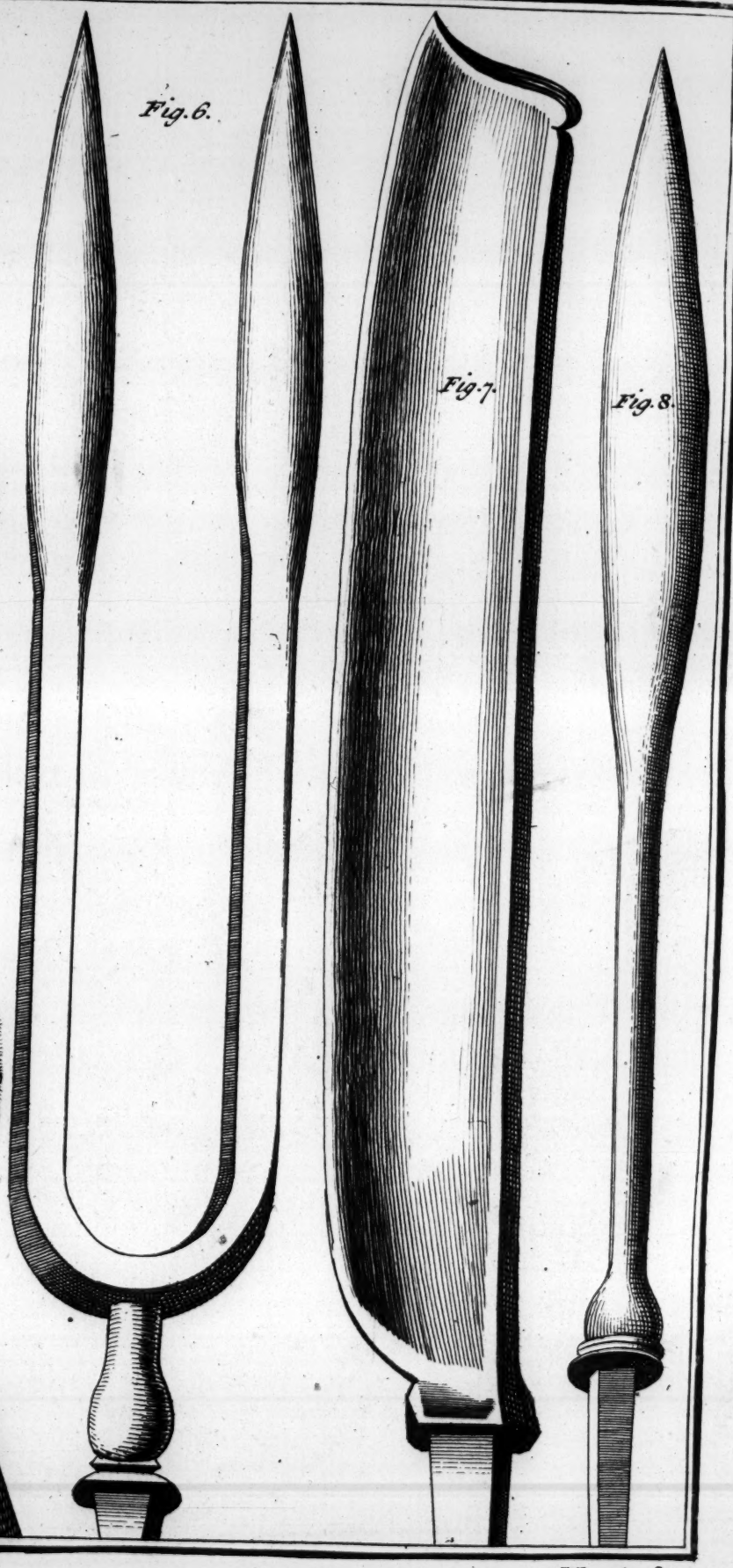


Fig. 10.

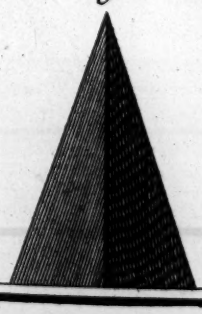


Fig. 7.

Fig. 8.

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Diſcharge, the Dreſſing may be repeated the oftner, and made with dry Lint only, which has been moiſtened with a little Tincture of Myrrh and Amber, inſtead of digeſtive Ointments, which will leſſen the Diſcharge that generally weakens the Patient. [a] In the mean Time, the Patient is to be ſupported not only with good and eaſy Nouriſhment, as Broths, Gellies, Cuſtard, *&c.* but alſo with mild Cordials and pleaſant Emulſions. On the contrary, the Surgeon ſhould be equally ſolicitous to avoid too great Dryneſs, as diſcharge of the Parts, which has been by ſome Authors obſerved as a Mark that the Diſorder will return: In this Caſe, it may be therefore proper to apply *Mel Roſarum* to promote a good Digeſtion of the Parts. When the Cancer has been by theſe Means cured, the Patient ſhould ever after obſerve a regular Way of Life, avoiding Exceſſes of all Kinds, and obſerving to bleed and purge at proper Intervals, eſpecially Spring and Fall. If a Fever, with Pain and Anguiſh about the Thorax, attended with a difficult Reſpiration, ſhould ſucceed the Operation; it uſually terminates in Death: To prevent which, the Patient ſhould be bled, and treated as in other Fevers. Some Women ſuſtain the Operation with ſurprizing Courage and Intrepidity of Mind, while others are equally puſillanimous and terrifying with their Clamours; to which the Surgeon ſhould be deaf, according to the advice of CELSUS, to ſucceed the better in his Operations.

An EXPLANATION *of the* TWENTY THIRD PLATE.

Fig. 1. Is the Pliers or Tenaculum of HELVETIUS, ſerving to ſqueeze and hold up the cancerous Breaſt by its two Arches AA, while the Surgeon takes it off by cutting below them.

Fig. 2. Exhibits another ſteel Tenaculum, alſo invented by HELVETIUS, for the ſame Purpoſe; AB, its two Sides or Wings, ee, the Rings of its Handles for the Fingers; D, the Hinge by which it is opened and ſhut, to receive and compreſs the Breaſt.

Fig. 3. Repreſents a new Inſtrument for amputating cancer'd Breaſts. AA, is a ſemi-circular and double braſs Plate, joined ſo as to leave a Space DDD between, to receive and direct the falciform Knife, EF aaa, the lowermoſt of the theſe Plates. BB, is another ſemi-circular and ſingle braſs Plate to act againſt the former, compreſs, and elevate the Breaſt. G, the Screw by which they are joined to form a compleat Circle to compreſs the Breaſt. CC, the two Handles of the ſemi-circular Plates. F, the Handle of the falciform Knife, which being tranſmitted through the Fiſſure, D, it moves acroſs the Plates, AB, to amputate the Breaſt as in *Fig.* 4.

Fig. 4. Repreſents the left Breaſt of a Woman, cancerous, and going to be amputated. A, the cancerous Breaſt, B, the Arm extended, cc, the two ſemi-circular Plates, by which the Breaſt is compreſſed and elevated, D, the left Hand of the Surgeon holding the two Handles of the ſemi-circular braſs Plates, E, the right Hand, guiding the Handle of the falciform Knife, which is to be moved in the Direction, FGH, to divide the Breaſt.

[a] In this Caſe the Uſe of *Alum. uſt.* with a little *precip. rub.* has been recommended to me as very effectual, in ſpeedily forming a firm Cicatrix.

Fig. 5. Is a kind of Needle for making the tranſverſe Seton; A, the Eye of the Inſtrument through which the Ligature is to be drawn, and when it has paſſed through the Integuments to B, the Ligature is to be drawn out of the Eye, A, and left in the Wound while the Inſtrument is drawn back again. C, the Part of the Inſtrument which is to be faſtened in a wooden Handle.

CHAP. CVIII.

Of the Paracenteſis or Perforation of the THORAX.

When the Paracenteſis is neceſſary.

I. BY Paracenteſis Phyſicians underſtand a Perforation of the Thorax, Abdomen, and ſometimes the Scrotum, to diſcharge Water, Blood, Matter, or ſuch other preternatural Subſtances as are there lodged. But the Paracenteſis or Perforation of the Thorax, which we here conſider, is uſually made between the Ribs, in ſeveral Diſorders, and particularly in the Empyema or Diſorder in which a purulent Matter is contained in the Cavity of the Thorax, after an Inflammation and Suppuration of the Lungs and Pleura; which if it be not timely diſcharged by this Operation, not only obſtructs Reſpiration, but alſo returns into the Blood, by corroding the Lungs, Diaphragm, *&c.* and occaſions a continual Hectic, with a Conſumption of the whole Body, and other bad Symptoms. 2. This Operation may be neceſſary to diſcharge Blood, which has been extravaſated into the Cavity of the Thorax, in Wounds of that Part by whoſe Orifice it cannot be diſcharged, but proves the Cauſe of many Diſorders, which we before declared in *Part* I. *Book* I. *Chap.* X. *N°.* 10. This is by the *French* improperly called the Operation for the Empyema; ſince Matter is neceſſary to conſtitute that Diſorder: It ſhould therefore be called, barely in this Caſe, the Paracenteſis of the Thorax. The Paracenteſis is alſo neceſſary, 3. In a Dropſy of the Breaſt, by which the contained Water, fluctuating in this Cavity, and obſtructing the Patient's Reſpiration by its Weight, may be diſcharged; but before we proceed to the Operation, it ſhould be firſt conſidered whether the Patient's Strength will admit of it, or his Diſorder be thereby relieved. Becauſe weak Patients often expire in or ſoon after the Operation. The ſame Event uſually attends this Operation alſo, when the Diſorder is become ſo inveterate, as to diſſolve or ſuppurate the Viſcera, and occaſion a Fever, attended with Looſeneſs, great Difficulty of Breathing, Faintings, or cold Sweats, which are the uſual Forerunners of Death; and import, that this Operation will not be attended with its due Succeſs; and that therefore the Surgeon may hereby gain Reflections, but no Credit. But if the Diſorder be yet recent, and the Patient ſtrong, he may then ſafely venture on the Paracenteſis of the Thorax, which may be perforated without any Danger by a prudent Surgeon, who divides only the Skin, Fat, intercoſtal Muſcles, and Pleura.

What part of the Thorax ſhould be perforated.

II. Two Things are neceſſary to be conſidered before the Operation; (1) in which Side of the Thorax the Matter is contained; and 2^dly^, what Part of that Cavity is moſt proper to be perforated. In order to diſcover the firſt, the Surgeon ſhould attend diligently to, (1) in which Side the Patient has before had any Pain or Inflammation: (2) In what Part he perceives the Weight and Fluctuation

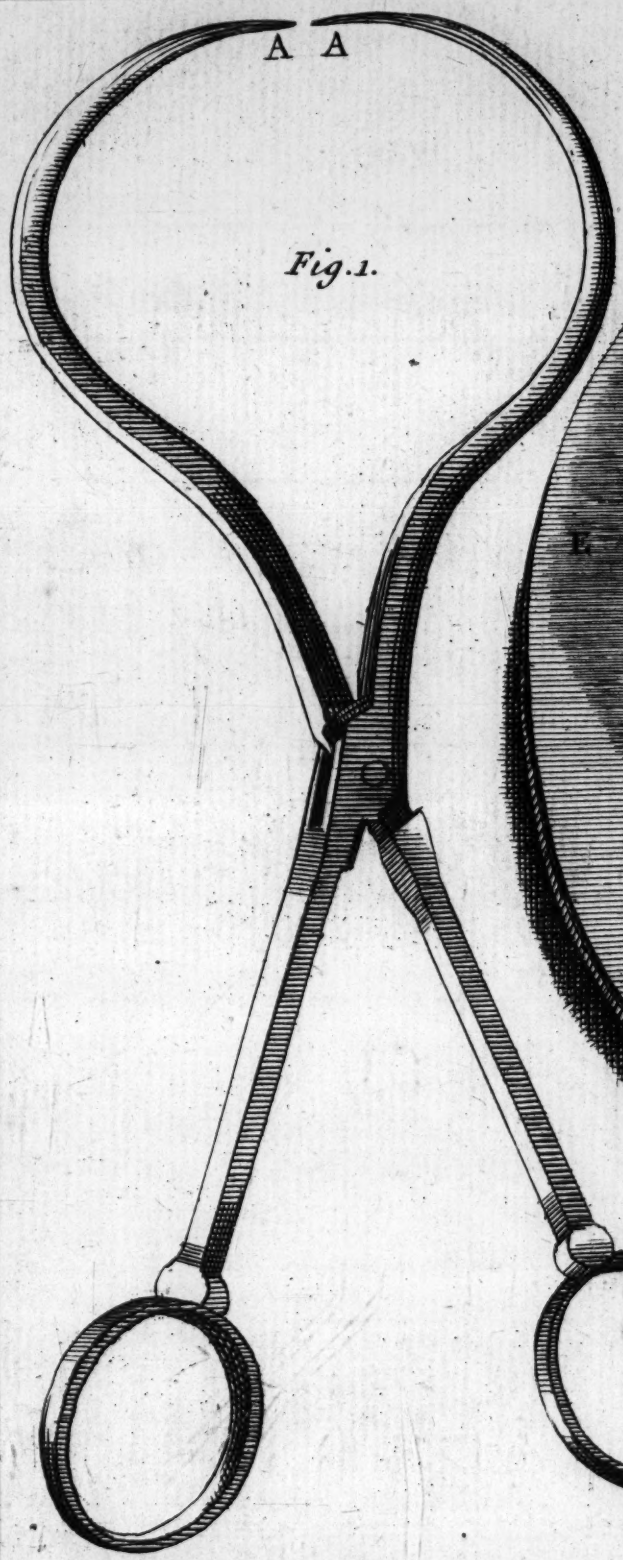


Fig. 1.

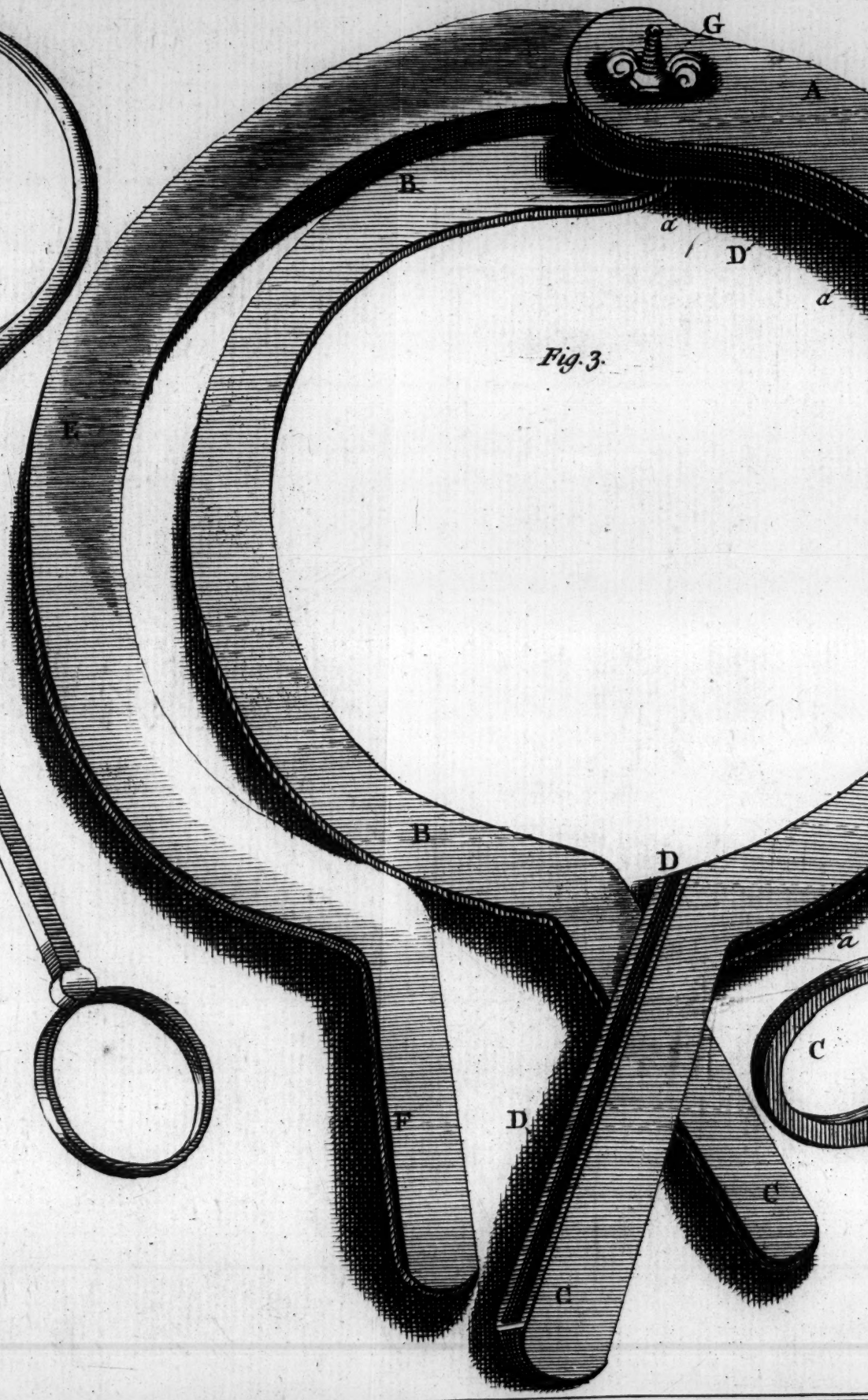
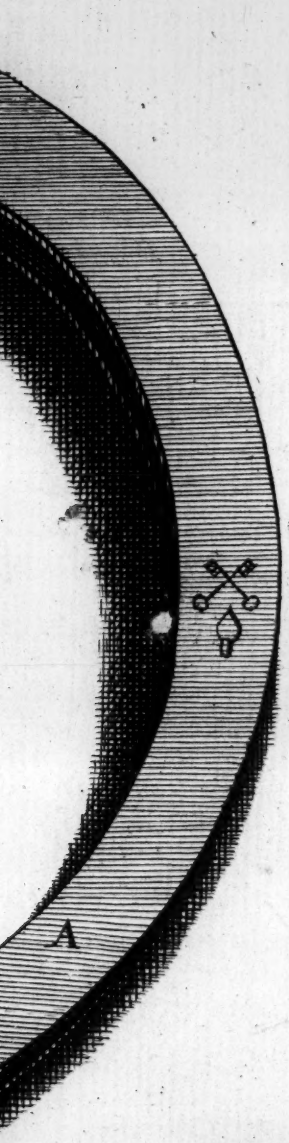
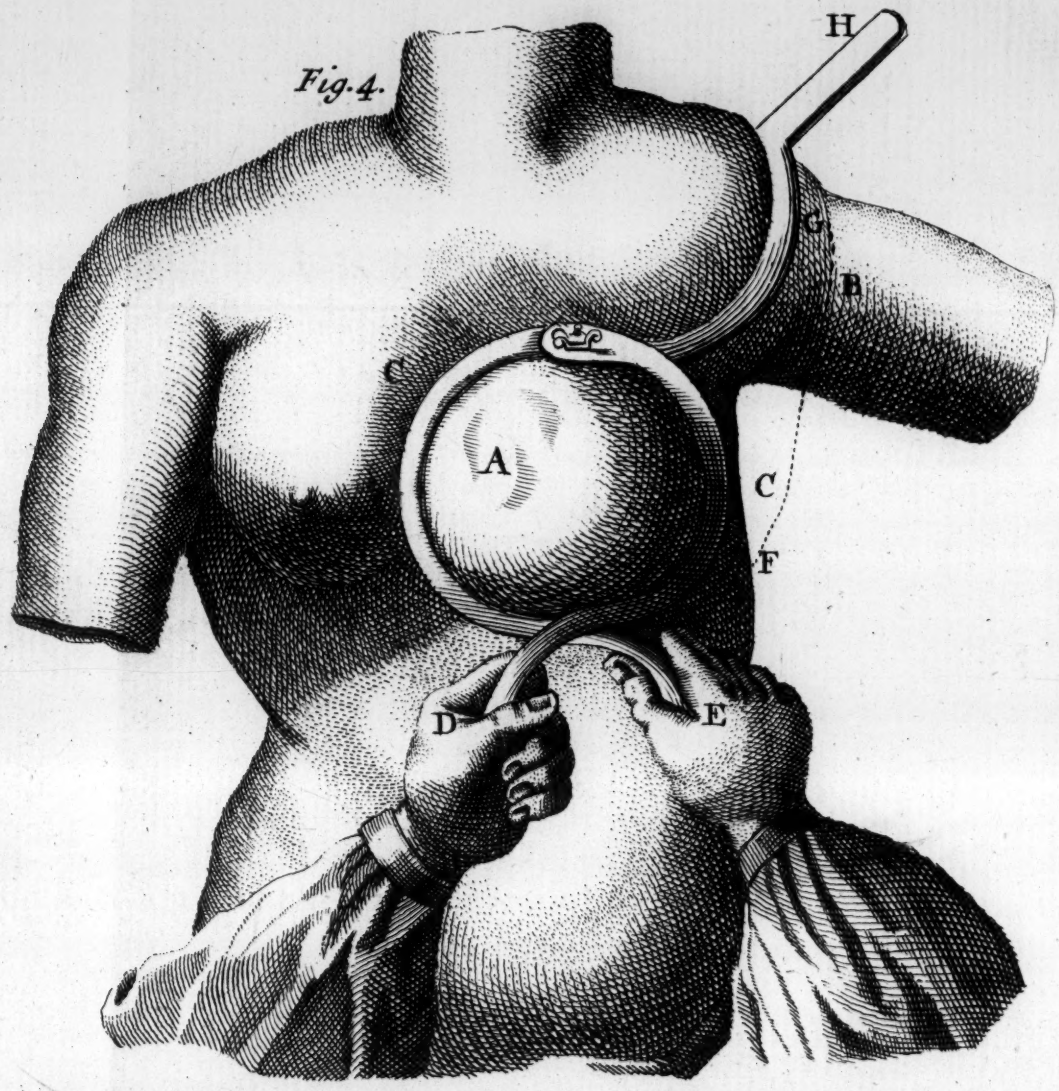


Fig. 3.

Fig.4.





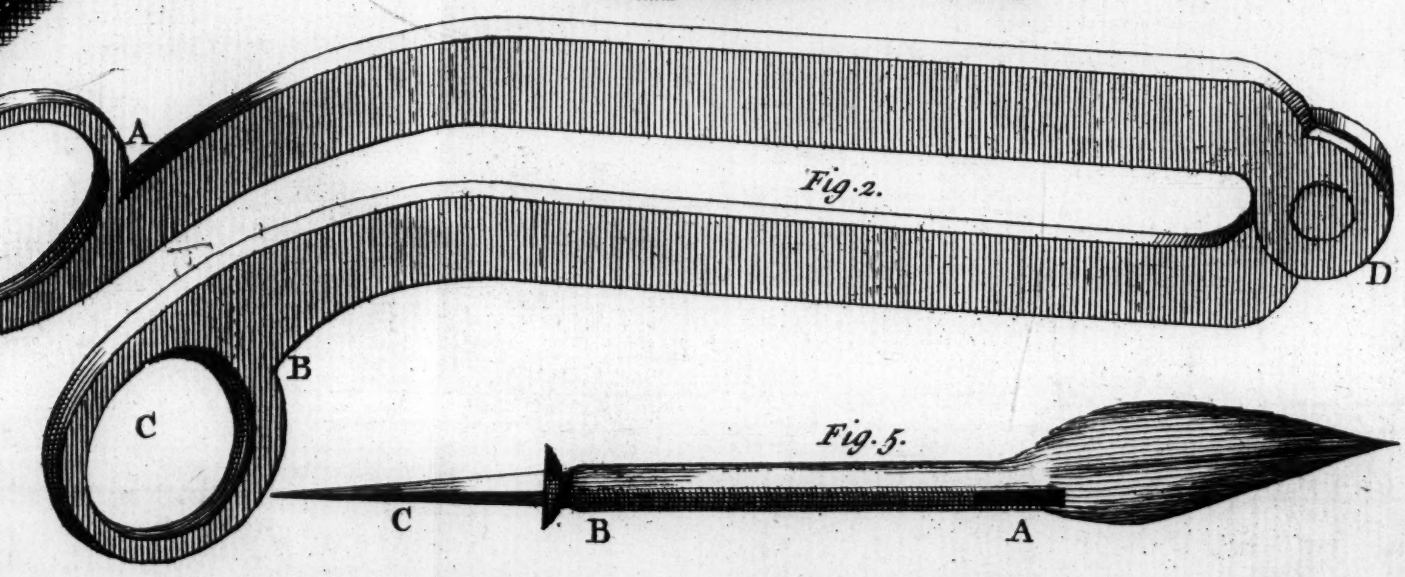


Fig.2.

Fig.5.

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tuation of Matter: (3) On which Side he can lie eaſier than on the other, for that is uſually the Side affected; the Perſon not being able to lie on the ſound Side, becauſe of the Weight or Preſſure of the Matter on the Mediaſtinum: (4) And laſtly, he may generally perceive ſome Tumor and inflammatory Heat in the Side affected. Having diſcovered which Side of the Thorax is to be perforated, the Operation may then be ſafely performed between the ſecond and third of the ſpurious Ribs on the left Side, or between the third and fourth on the right Side, counting from below upwards, ſo as to be about five or ſix Fingers Breadth from the Spine of the Back,[a] and as much below the Angle of the Scapula: For if the Thorax be perforated higher, the peccant Matter lodged in the Bottom of its Cavity will not be eaſily diſcharged; and if the Operation be made lower, there is Danger of wounding the Diaphragm, eſpecially on the right Side, where it adheres higher up to the falls Ribs, by reaſon of the ſubjacent Liver. Nor can the Perforation be eaſily and ſafely made near the Spine of the Back; becauſe of the Thickneſs of the Integuments and Muſcles, with the Danger of injuring the intercoſtal or other Veſſels. The Place here aſſigned is therefore the moſt convenient and ſafe for the Paracenteſis.

The Method of performing the Operation.

III. The Surgeon having marked the deſcribed Place with Ink, and taken up the Integuments between his own Fingers and thoſe of an Aſſiſtant, as in cutting Iſſues; he then makes an Inciſion of about two Inches long, according to the Courſe of the Ribs, that he may afterwards more eaſily perforate the intercoſtal Muſcles. The Part thus prepared is then perforated with the Trocar (*Tab.* XXIV. *Fig.* 1.) according to the Practice of ſome Surgeons, which being introduced into the Cavity of the Thorax, its triangular Bodkin (*Fig.* 2.) is extracted, and the Tube only left in the Wound, whereby the Humours are drawn off and diſcharged as long as the Patient's Strength will admit; and when the Patient is perceived to be near fainting, or the Matter appears to be totally evacuated, the Cannula of the Trocar may be then ſuddenly removed, and a flexible Tube (*Tab.* V. *Fig.* IX.) of Silver or Lead (*Tab.* II. *Fig.* 5.) inſerted in its Place, which may be faſtened to the Thorax, with a Piece of Plaſter and a Ligature. Over the Mouth of the Tube may be applied a Compreſs, retained by the Bandage called the Napkin and Scapulary. Sometimes the Trocar is introduced through the Integuments and intercoſtal Muſcles by one puſh againſt its triangular Bodkin; but as the Lungs, which frequently adhere to the Pleura, may be by that Means injured, the following Method is always preferred by cautious and prudent Surgeons; *viz.* Having prepared the Integuments by Inciſion as before, they then cautiouſly divide the intercoſtal Muſcles, and Pleura by a tranſverſe Inciſion with the Scalpell, G or H, *Tab.* I. and having introduced the Cannula as before, the contained Humours of the Thorax are thereby diſcharged. During the Operation the Patient ſhould be retained in an inclined Poſture, by which Means the Ribs will be elevated more from each other, and a larger Space made for the Inciſion. A ſufficient Opening being made into the Thorax, the Finger is then to be introduced, in order to ſeparate the Lungs from its Adheſions to the Pleura, and to make Way for

[a] BOERHAVE (Aphor. 303.) tells us the Perforation ſhould be made between the ſecond and third of the lower *true* Ribs, which is contrary to the Opinion of all expert Surgeons; but he might poſſibly intend, *falſe* Ribs, which adjuſts the Difference.

the peccant Humours: Which laſt Method of performing the Paracenteſis is certainly preferable to the former, notwithſtanding it requires more Diligence in the Operator and Reſolution in the Patient; for beſides avoiding the Lungs, which would elſe be probably wounded, they may be ſeparated by the Finger or Probe without Damage, and a larger and more perfect Diſcharge made of the offending Matter. And if we take the Advice of PETIT, we ought totally to abſtain from the Uſe of Tubes or Tents in the Operation, as they are attended with ill Conſequences: Only ſtopping up the Orifice of the Wound with a Piece of ſoft Linnen-rag convoluted or rolled up, whereby it may be kept open for future Diſcharges: But over the Obſtacle of the Wound, is to be applied ſoft Lint, faſtened to a Thread, and to be retained with Plaſter, Compreſs, and Bandage.

Dreſſing after the Operation.

IV. The Dreſſing may be afterwards made once or twice a Day, diſcharging and waſhing out the Matter, by injecting ſome deterging Liquor at each dreſſing, which may be repeated according to the Patient's Strength. A Decoction for this Purpoſe may be made of vulnerary Herbs, as *Verionica*, *Scabioſa Solidago Saracenica*, with *mel Roſarum* and Oil of Myrrh; and if the Patient is not troubled with a Cough, a little Tincture of Myrrh, and WURTZ's pectoral Balſam. GARENGEOT frequently recommends a Decoction *ex Perſicaria* and *Althea*, when the Diſorder ariſes from a Pleuriſy or Peripneumony; though a Tincture of Sulphur of Antimony, made with Spirit of Wine, is alſo very efficacious in deterging and healing theſe Parts. Others extol a Mixture of *Aq. Calcis* with *mel Roſarum*. Theſe Injections ſhould be continued till they are obſerved to return clean, and unmixed with bloody or purulent Matter, which is a Sign that the Parts are healed and become ſound, whereupon the Tube or Lint may be withdrawn from the Perforation of the Thorax, and the reſt of the Cure compleated according to our Directions in Wounds of the Thorax. It may be however obſerved, that the Diſcharge of the injected Liquors may be much promoted by the Patient bending himſelf towards the Wound, and fetching a deep Inſpiration; and during the whole Cure it may be equally advantageous to join internal Medicines, eſpecially vulnerary Decoctions and Balſams, with a proper Regimen and Diet, in this, as in other Diſorders. See a Hiſtory of this Operation, performed in an Empyema, in SCULTETUS, *Obſ.* 52.

Ulcers of the Breaſt running under the Integuments.

V. It is to be here obſerved, that the Matter formed after Pleuriſies and other Inflammations of theſe Parts does not always penetrate into the Cavity of the Thorax, but tends ſometimes externally under the Integuments, ſo as to form an Abſceſs or Tumor; in which Caſe, the Surgeon is to open, not the Thorax, but the Tumor itſelf, which is the Seat of the Diſorder, and appears externally, though it may be in Part contained in the Thorax as well as on its Surface. The Matter contained in theſe Abſceſſes is ſometimes ſo acrimonious, as to corrode the Ribs and greatly ſpread the Diſorder; in which Caſe, if the carious Parts of the Ribs cannot be removed, it is almoſt an impoſſibility to effect a Cure.

CHAP. CIX.

Of trepanning the STERNUM.

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PART II. SECT. V.

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the Surgeon and Phyſician ought to be acquainted with it: For if they ſhould chance to be preſent at an unexpected Labour, and know nothing of this Affair, the Infant may be loſt, by bleeding to Death, to the great Damage of their Reputation.

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can in thoſe Dropſies which come upon the Patient, not by Degrees, but all at once, which is a Sign of ſome large lymphatic Veſſels being burſt. But for the Operation itſelf, it is neither dangerous nor very troubleſome to the Patient, as the inflicted Wound is but ſmall, and made in a fleſhy Part.

The Method of diſcovering Water in the Abdomen.

II. That the Surgeon may be firſt well aſſured there is a Quantity of Water in the Abdomen, before he undertakes the Operation, he is to apply his two Hands on each Side the Patient's Belly as he ſtands or ſits, and to ſhake it from one Side to the other, by which Means he will perceive a Fluctuation of the Water from one Side to the other, which cannot be obſerved when the Lymph is not extravaſated into the Cavity of the Abdomen, in which laſt Caſe the Operation is uſeleſs.

First Method of performing the Operation.

III. There are ſeveral different Methods uſed for performing the Paracenteſis of the Abdomen, which we ſhall explain in order. The firſt and neweſt is by laying the Patient on the Side of his Bed, and inſerting the Trocar (*Tab.* XXIV. *Fig.* 1.) into the Cavity of the Abdomen, at or about the Diſtance of eight Fingers breadth from the Navel, or in the Middle of the Space between the Navel and Angle of the *Os Ilium*, and after drawing out the Sharp pointed Bodkin *Fig.* 2. from the Cannula *Fig.* 3. which is left in the Wound, ſo much of the Water may be drawn off at a Time as the Patient can well bear, and if the Patient does not grow faint, the whole Quantity may be drawn off at once. In order to keep them from fainting, it is uſual for the two Hands of the Surgeon or an Aſſiſtant to preſs on each Side of the Abdomen during the Operation, or the Swath made of broad Linen perforated in the Middle, as at *Fig.* 8. *Tab.* V. may be put round the Abdomen, and gradually drawn tighter, as we have directed in longitudinal Wounds of the Abdomen, till all the Water is evacuated, after which may be applied a flannel Compreſs to the Abdomen, which has been expreſſed out of *Sp. Vin.* to be retained by a tight Roller, by which Means, as I have frequently obſerved, the Patient not only avoids fainting, but rather becomes more eaſy and robuſt, ſo as to walk about after the Operation. But, on the contrary, as HIPPOCRATES obſerves, if the Abdomen is not compreſſed, when there has been a large Diſcharge of Water all evacuated at the firſt opening, the Patient always faints, and often dies, either in or ſoon after the Operation. It is therefore the Advice of many Phyſicians to diſcharge but a few Pounds of Water at a Time according to the Strength of the Patient, after which the Cannula may be extracted, and as the Wound is but ſmall, almoſt cloſing of its ſelf, it may be dreſſed only with a Couple of ſquare Compreſſes, Plaſter, and Bandage, repeating the Operation the next Day, in the other Side of the Abdomen, if the Patient's Abilities permit, and ſo on the third Day, about two Fingers breadth above the laſt Perforation. Freſh Wounds are made rather than to keep open the firſt, to prevent them from mortifying, to which they are very ſubject in hydropical Subjects. In the mean time, the Patient ſhould be aſſiſted by a proper Diet, Regimen, and courſe of Phyſic, till he either recovers, or by relapſing, requires the Operation to be repeated. With regard to the Situation of the Patient in this Operation, he uſed formerly to be ſeated on a Chair or Bed, but many of our modern Surgeons after PETIT rather approve of laying him on one Side of the Bed, by which Means the Trocar may be more commodiouſly inſerted into the lower and lateral Part of the Abdomen, the Water more perfectly diſcharged, and the Patient rendered

not

not ſo ſubject to faint as in the perpendicular Poſture. It is alſo the Advice and Practice of many modern Surgeons, to draw off the whole Quantity of Water at the firſt Tapping [a], and to repeat it upon a Return of the Diſorder; but in weak Patients I ſhould rather approve of the former, as the ſafeſt Method. For the Inſtrument uſed in the Operation, that is moſt approved of by PETIT, whoſe Cannula has a long Slit in it, as at *Tab.* XXIV. *Fig.* 4. AA, by which he thinks the Water may be more conveniently diſcharged than by the other: And laſtly, that the Inſtrument may meet with a more eaſy Paſſage in thruſting it into the Abdomen, the End of it may be firſt dipt in Oil.

The 2d and 3d Way of making the Paracenteſis.

IV. It was a Practice among the Ancients to inſert a Knife, whoſe Point was about a third Part of an Inch broad into one Side of the Abdomen, about four Fingers breadth below the Navel, having uſually perforated the Skin firſt with a Cauſtic: And having introduced a Cannula of Lead, Copper, or Silver, they diſcharged ſo much of the Water at a Time as the Patient's Strength would permit. The Cannula for this Purpoſe was about the Length of two or three Fingers breadth (*Tab.* II. *Fig.* QS) being either crooked in its external Part, or furniſhed with a Rim, to prevent it from paſſing quite into the Abdomen; and when a ſufficient Quantity of Water had been diſcharged by it, the Cannula was left in the Wound, and its Orifice ſtopped with a Cork or Doſſil of Lint, over which was applied a ſticking Plaſter, Compreſs, and Bandage, with the Napkin and Scapulary. The next Day they repeated the Diſcharge again. But there is no doubt that the modern Practice is much more preferable, becauſe by leaving the Cannula in the Wound it is almoſt impoſſible to avoid Inflammation, Mortification, or other bad Symptoms. To avoid theſe Inconveniences, BARBETT contrived a hollow Sort of Lancet or ſilver Cannula, which had a Foramen on each Side, that it might ſerve as well to diſcharge the Water as perforate the Abdomen; but as the Inteſtines were in danger of being injured by the ſharp Point of this Inſtrument, when the Water was near diſcharged, the Moderns more judiciouſly contrived and uſed the preſent Inſtrument, with the Cannula and ſharp pointed Needle or Bodkin, called a *Trocar*.

Some uſeful Obſervations.

V. Though the Trocar is a ſharp pointed Inſtrument, yet there is no Danger of wounding the Inteſtines by it, when thruſt into the Abdomen; becauſe there are kept at a conſiderable Diſtance from the Inſtrument by the intervening Water.: But was the Inſtrument to touch the Inteſtines, they would receive no great Injury, as they make but little Reſiſtance. If the Cannula ſhould be obſtructed with any thing, the Obſtacle may be removed by a Probe, and a free Paſſage thereby made for the Water. Sometimes the *Navel* and Parts adjacent are ſurprizingly diſtended in hydropical Subjects, in the Manner obſerved by HILDANUS, *Obſ.* 47. *Cent.* 1. & *Permannus Chirurgia Curioſa*, p. 330. in which Caſe it is propoſed by ſome Surgeons to perforate the Navel, to which they are encouraged by reading of a Patient cured by a ſpontaneous Rupture of this Part, though it generally proves very troubleſome; for beſides the Difficulty of diſcharging the Humours, the Wound made in this Part hardly ever

[a] The Succeſs of this Practice is inſtanced *in Act. Medic. Berolin. Tom.* IX. *Art.* v.—*Act. Acad. Reg. Paris* 1703. *Journal des Sçavans, ann.* 1722. *Menſ. Julio.* DIONIS and GARENGEOT alſo aſſert, that extracting all the Water at the firſt Time weakens the Patient little or nothing, if a proper Preſſure and Bandage be uſed.

heals. I cannot omit mentioning in this Place a remarkable Caſe, which I remember ſometime ago in a dropſical Woman at *Noremberg*; in whom, after I had tapped the left Side of the Abdomen in the Preſence of ſeveral Phyſicians, who had alſo adviſed the Operation, a large Quantity of Water was diſcharged to the great Eaſement of the Patient; but upon perforating the right Side on the next Day, no Water could be diſcharged: I therefore, with the Conſent of the Phyſicians, again perforated the left Side, upon which we had another copious Diſcharge of Water; but the next Evening, notwithſtanding the Abdomen was well ſecured with Bandage, the Patient was ſeized with a violent Vomiting, without any manifeſt Cauſe, by which ſhe was ſo much weakened, that it was judged uſeleſs to make any more Diſcharge of the Water, and ſhe expired a few Weeks after, though I was not permitted to ſearch for the Cauſe of this uncommon Appearance in the deceaſed.

Other Uſes of the Paracenteſis in the Abdomen.

VI. Though tapping of dropſical Patients does not frequently cure them of the Diſorder, it at leaſt eaſes them of the Oppreſſion, difficulty of Breathing, and other Symptoms, with which they are afflicted, inſomuch that they cannot ſleep, but are obliged to ſit up both Day and Night, which renders this Operation abſolutely neceſſary. Inſtances of this Operation being performed with Succeſs, may be read in *Voelteri Schola Obſtetricia*, pag. 63. Pechlini Obſ. 62. *Nuckei adenograph.* p. 122. Brunner in *Ephem. Nat. Cur. dec.* 2. *An.* VIII. *Sinibaldi Methodo parva*; *Saviardi Obſ.* 119. *Hiſt. Acad. Reg. Pariſ. An.* 1703. *Ubi multa à Verneo referuntur*; *Dionis Chirurgia*; *Helvetii lib. de Sanguinis Profluviis*, p. 79. *Act. Med. Berolinenſ.* Vol. IX. and X. not to mention the ſeveral Places before quoted in this Chapter.

CHAP. CXIII.

Of the Cæſarean Section or Birth, being the Method of cutting the Fœtus out of the Womb.

The Nature and Kinds of this Operation.

I. THE Cæſarean Section or Birth is a chirurgical Operation, by which the Fœtus is by a careful Section delivered from the Womb of its Mother, when it cannot be delivered in the natural Way: It is by the Greeks called *Hyſterotomia*. There are many of the moſt eminent Phyſicians and Surgeons, who condemn this Operation as barbarous and mortal, ſuch as Parey, Guillememaeu, Rolfinc, Horn. Mauricaeu, Solingen, and others; but upon peruſing the Writings of theſe Authors, I do not find they promiſcuouſly condemn both kinds of this Operation, but only the more dangerous one of cutting out the Child whilſt its Mother is living, which is certainly a fatal Operation: As they make appear by many Inſtances of the Operation being unhappily performed. There are chiefly three different Caſes, in which this Operation is practicable; the firſt is, *when the Mother is dead*, either in the Birth, or by ſome Accident, *while the Fœtus* is perceived, or reaſonably ſuppoſed to be yet *ſurviving* in the Womb. The ſecond is, *when the Mother is living and the Fœtus dead*, but incapable of being expelled or extracted by the natural Paſſages, by any Aſſiſtance, either of the Midwife or Surgeon. The third and laſt Caſe is, *when the Mother and Fœtus are yet living*, but the latter is incapable of being brought into

into the World by the natural Passages, by which Means both of them are in the greatest Danger if not relieved by this Operation. And though some deny that the Fœtus can survive the Death of its Mother, and assert that both decease together [a]; yet I have evidently proved the contrary, by many Instances, in a Treatise, intituled, *Fœtum ex utero matris mortuæ mature excidendum esse:* To which may be added the Authorities below [b], and many others.

II. In the first Case, when the Mother is deceased, and the Fœtus reasonably supposed alive, there are few or no expert Surgeons, who disapprove of the Operation, without which the Fœtus would necessarily die, together with the Mother; and as delay in this Case is dangerous, they universally agree, that the Operation should be performed, not only as soon as possible, but even before the Circulation in the Mother is stopped, because the Fœtus cannot long survive: And in this Sense we have many Instances of the Operation being performed, as well among the Ancients as Moderns; for Example, LYCA of *Esculapius*, SCIPIO AFRICANUS, thence called CÆSAR, and MANLIUS an Officer at *Carthage*, and as some say the Emperor JULIUS CÆSAR; among the Moderns we may reckon EDWARD the VI. King of *England*, and SANCTIUS King of *Navar*, and several others, which are taken Notice of by Authors, and called CÆSARS, from the Operation [c]. When the Surgeon therefore perceives the Mother to be in the Agonies of Death, he should be getting every Thing ready for the Operation, that when she has deceased, he may have nothing more to do than open the Abdomen [d] by a crucial Incision, as in common Dissections; or if he would proceed more cautiously, by making a longitudinal Incision on one Side with a Razor or Scalpell, without Respect to the Course of the Fibres in the Muscles or Vessels; and if the Fœtus should have fallen into the Cavity of the Abdomen [e] from a Rupture of the Uterus, or other Cause, it should be then taken out

First in the dead Mother.

[a] As Casp. BAUKIN in Lib. Anat. *Roderic à Castro de morb. mulier.* Lib. IV. Cap. 3. and among the Moderns the celebrated Monsr. MERY in particular, *in Act. Acad. Reg. Scient. An.* 1708.

[b] The Fœtus has been observed to move in the Mother's Belly the Day after her Decease by DOLEUS, *Encyclop. Chir. Lib.* IV. *Cap.* 5. *ult.* To which may be added TH. CORNELIUS, *Progymnasm.* 5. *de Generatione*, p. 207. VESLINGIUS's *Obs. & Epist.* 7. p 48. TIMÆUS *a Guldenkle, Op. Med. p. m.* 1082. GEO. FRANCUS, *in Satyr. Med.* IV. SCHELHAMMERUS *in Misc. Nat. Cur. Dec.* II. *Ann* 5. *Obs.* 14. MAURICEAU's *Obs.* 315. & 593. ROONHUYS *de Morb. Mulier.* ALBINUS's *Diss. de Partu difficili.* VIARDEL *traite des Accouchmens.* VATERUS *in Diss. de Partu Cæsareo ut & de Partu Hominis post mortem Matris.* LA MOTTE, *Lib.* IV. *Cap.* 6. and *Cap.* 13. BRENDELIUS *in Obs. Anat.* VIII. *Dec.* II. SCHACHERUS *in Program. Lipsiæ*, 1731, *edito de Fœtu ex utero Mortuæ excindendo, aliique.*

[c] PURMANNUS (*in Chirurg. Curios.* Part II. Cap. 10.) took out a Male Fœtus alive from the Womb of its dead Mother by this Operation, which it afterwards survived. The like Case may be read in *Ephem. Nat. Cur. Cent.* III. *Obs.* 57. *p.* 136. CAROL. STEPHANUS, *Lib.* III. *Cap* 1. *Horat.* AUGENIUS, *Lib.* IV. *Epist* 2. JO SCHENCKIUS, *Obs. Lib.* IV. GUILMEAU, *Lib. de Art Obs loc cit.* VOELTERUS, *Lib. de Art. Obs. Lib.* II. *Cap.* 13. MAURICEAU, *Obs* 26, 251, 315, 353, 374, & 593. and JO. VALENT *Andrea Selenia Augustalia, p.* 361. relates the taking out two Male-Twins alive, from the Uterus of their Mother, who had been shot dead, *&c.*

[d] Some (as GUILIELMEAU and CAROL. STEPHAN) advise to keep open the Vagina by the Finger, and the *Os Uteri Interni* with a Stick till the Mother is deceased, that the Fœtus may have Air to breath; but as the Fœtus has no Respiration in the Womb, that Caution is both useless and unnecessary.

[e] Which has been observed by STRAUSSIUS, BAYLIUS, SAVIARD, COURTIAL, BIANCHUS, CALVUS, ANELUS, *Lib. de fist. loc. Part* II. *Pag.* 294. Our Compend. of Anatomy, *Note* 35.

immediately; and as it is uſually very weak, a little Wine, Hungary-water, or the like, ſhould be held for it to ſmell at, or a little of the firſt given it to drink, endeavouring to recover it by blowing into its Mouth and Noſe, baptizing it immediately in cold Water, and tying up the Navel-ſtring as we have before directed. But if it remains concealed in the Womb, that Body ſhould then be cautiouſly opened, and the Fœtus extracted, the Navel-ſtring tied and divided, and the Child recovered as before, which compleats the Operation. If the Fœtus ſhould be concealed in the Ovary, or the fallopian Tube, which is ſometimes the Caſe, it is to be alſo thence cautiouſly extracted; but the Surgeon ſhould carefully diſtinguiſh whether the Mother be dead or only in a Deliquium, leſt he perform the Operation raſhly, as we are told happened to VESALIUS: He ſhould be rather well ſatisfied that the Mother is dead, from obſerving whether there be any Motion of the Heart, Arteries, and Lungs, and have the Conſent of the By-ſtanders, in his Opinion, before he enters the Knife, though we do not know of any Inſtances of the Operation being performed when the Subject has been miſtakenly ſuppoſed dead, but really alive; and even if the Caſe ſhould be ſo, the Surgeon ought not to be much terrified thereat, becauſe he is not committing Murder, but does it with a good Intent to preſerve the Fœtus, to which he is obliged, as well by religious as national Laws; and in ſuch a Caſe he may ſtitch up the Wounds again, and treat them according to our Directions in the firſt Part, and that poſſibly to good Effect, eſpecially if the Opening was made barely by a longitudinal Inciſion on one Side; for if the Surgeon ſhould delay too long through Timidity, the Fœtus may be loſt, and his Operation performed in vain. Others condemn the Operation, becauſe we are not certain the Fœtus is yet living, in which Caſe they never fail to be treated with Reflections from the common People; but in my Opinion, admitting this to be true, it is better to open ten, nay, a hundred dead Women in vain, than to loſe the Life of one Fœtus for want of the Operation.

That all Women dying before Delivery ſhould undergo the Operation.

III. My general Advice is, that the Operation be performed as ſoon as poſſible upon all Women dying before, or in Delivery; partly, that the Fœtus may be taken out alive, baptized, and preſerved from the Jaws of Death to Poſterity; and partly for the better Information of Phyſicians, Surgeons, and Midwives, to acquaint them with the Diſpoſition, Structure, Situation, *&c.* of the Womb, in a gravid State, with that of the Fœtus and After-burthen, that they may the better aſſiſt others in the like Caſes; and partly, as DEVENTER obſerves, to detect the Cauſe, whether the Midwife or Surgeon has by their Ignorance and Miſ-conduct occaſioned the Misfortune, that they may be better informed or duly puniſhed. Much more might be ſaid in Vindication of this Practice, to ſhew that it is agreeable with the Roman Laws and Principles of Chriſtianity; but more may be ſeen upon this Subject, in *Diſſertatio Juridica de Jure Embryonum, Jenæ, Ann.* 1716. alſo NYMANNUS and WINCLERUS, *de vita Fœtus in utero*, and the Writers on Midwifry.

Miſcel. Nat. Cur. Dec. II. *Ann.* 5. *Obſ.* 63. *Hiſt. Acad. Reg. Sc. Ann.* 1716. *Act. Acad. Nat. Cur. Vol.* I. *Obſ.* 176. *Pag.* 397. PISTOR, *de Fœtu & rupto utero Abdomen prorumpente, aliique quamplurimi.*

IV. The

IV. The second Case, in which this Operation may be necessary, is, *when the Mother is living and the Fœtus dead*, without any Possibility of extracting it by the natural Passages: As when the Fœtus appears to be contained in the fallopian Tube, Ovary, or Cavity of the Abdomen [a], of which we have various Instances in Authors; or when it is lodged in a kind of Hernia or Sacculus without the Abdomen, as SENNERTUS [b] and HILDANUS [c] have described; or if it be obstructed by a callous, scirrhous, or other Tumor, in the Vagina or *Os Tincæ*, which may render the Extraction of it impracticable; or when the natural Passages are not large enough, either from an irremediable Coalition, or Callosity of the Vagina [d]; or from a bad Conformation of the Os Pubis, as sometimes happens in crooked Women, by which Obstacles the Fœtus is rendered incapable of being delivered, while the Mother is spent and in danger of Death, by the violent Pains, Convulsions, Hæmorrhage, *&c.* in all which Cases I think the Operation is necessary to preserve the Mother and Fœtus, notwithstanding it has been condemned by many of the ancient as well as the modern Surgeons and Physicians. For in such Cases the Extraction or Excision of the Infant, so as to bring it through the natural Passages, which MAURICEAU prefers to the Cæsarean Section, cannot be performed. There is therefore but one Remedy left to preserve the Life of the Mother and Fœtus when she cannot de delivered, and that is the Cæsarean Section, or cutting the Fœtus out of the Abdomen or Uterus, the Success of which Practice is confirmed by various Instances; so that MAURICEAU speaks contrary to Reason and Experience, when he pronounces this Operation always fatal to the Mother.

The second Case, when the Fœtus is dead and the Mother alive.

V. Though we are encouraged to the Operation by many, when the Mother is supposed to be deceased, and even when the Mother is alive, when Nature seems to point out for the Operation, by some painful Tumor or Abscess formed at the Navel, or in some other Part of the Abdomen, in which Case the Operation has succeeded by relation in many Instances, because the Hæmorrhage in that Case is usually small, and the Fœtus generally found in the fallopian Tube, Ovary, or in the open Cavity of the Abdomen itself; but when the Fœtus is contained in the Womb of its Mother yet living, without any Appearance of an Abscess, in that Case the Operation is condemned by many eminent Physicians and Surgeons, as both cruel and fatal: But that they entertain such an erroneous Opinion contrary to Reason and Experience, is made evident by many of their own Profession as below [e].

The Operation rejected by some in particular Cases.

[a] The Signs thereof are, no Relaxation of the *Os Uteri*, nor discharge of the Waters after the labour Pains have been felt, the Fœtus appears higher up in the Abdomen, and its Head, Arms, Legs, *&c.* may be more perfectly distinguished by feeling than usual. *Vide Welschii notam in Cap. de Sect. Cæsarea.* SCIPIO's *Mercur.* PISTOR's *Dissert de Fœtu rupto utero in Abdomen prodeunte. Diar. Erud. Paris.* 1722. *Mens. Junio.* SAVIARD's *Chirurg. Obs.* 60. DIONIS's *Dissert. de Generatione.* Our Compend. of Anatomy, *Note* 35.

[b] *Instit. Med. Lib.* II. *Part* I. *Cap.* 9.

[c] *Epist. de Hernia Uterina.*

[d] *Act. Erud. Lipsi. Ann.* 1693. *P.* 229. VATERUS *de Partu Cæsareo, Vitebergæ, Ann.* 1695. where he describes the Vagina to have been altogether callous, from a preceding Ulcer, and not large enough to admit a Pea. *V.* SAVIARD *Obs.* 114. MAURICEAU *Obs.* 26.

[e] The Operation is encouraged by ROSSETUS, BAUHINUS *Lib. de Partu Cæsareo.* SENNERTUS *in instit. Medic. & praxi Medica.* HILDANUS *Epist. de Hernia Uterina, in oper. Pag.* 897. FIENUS *in libris Chirurg. Cap.* VIII. SCULTETUS *Armam. Chirurg. Tab. de Partu Cæsareo.* SCIPIO

The Difficulty and Neceſſity of performing the Operation conſidered.

VI. It muſt indeed be confeſſed, that the Operation is both hazardous and dangerous to the Mother, eſpecially when there is no Abſceſs formed, but the Fœtus muſt be cut out of the Womb; and therefore it ſhould never be undertaken but in Caſes of the laſt Neceſſity; but that the Operation may ſometimes be performed with Succeſs, may be concluded both from the forequoted Authorities and thoſe which follow. Goveus, Rossetus, Mercurius, Welshius, and others, aſſert the Operation to be not only practicable with Succeſs, in a ſkilful Hand, but alſo alledge many Inſtances of thoſe who have recovered after the Operation, which they think to be no more dangerous than cutting for the Stone. But I cannot be of their Opinion, ſince there are many fatal Accounts of it given us by Writers, and eſpecially as there is great Danger of loſing the Patient from the great Hæmorrhage, or a Mortification following the Wound in the Uterus; therefore Mauriceau, and others, juſtly adviſe rather to extract the Fœtus by Inſtruments through the natural Paſſages, if poſſible, rather than to execute this dangerous Operation: But when that is impracticable, as it frequently may be, from the Cauſes before mentioned, ſo that both Mother and Fœtus are in the utmoſt Danger, it would even be barbarous to neglect an Operation, which may poſſibly be the Means of ſaving them both, which muſt otherwiſe inevitably periſh; for in ſuch a Caſe it is better to try an uncertain Means than none at all, as Hippocrates and Celsus adviſe, rather than leave the Patient deſtitute to the Extremities of Torture and certain Death, when there is a Poſſibility of Relief from the Operation, to which we are encouraged by many Inſtances of its Succeſs. Others think it better to leave the Event to Nature, when the Delivery is impracticable, than to expoſe the Patient to ſo hazardous and ſevere an Operation; for, ſay they, Nature often makes Way of herſelf, whereby the Fœtus may be diſcharged by an Abſceſs in the Abdomen at the Navel, Inguen, or Rectum; to which I readily aſſent, when the Patient is in no Danger of Death, by ſuch Expectation; but when the Patient's Life may be in the utmoſt Danger by waiting for ſuch an Event, I think the Operation ſhould be entered on without Delay, eſpecially when the Mother being deſirous of Life gives her Conſent. Others again are afraid of performing the Operation, leſt it ſhould injure their Character, an excuſe intolerable, even in a moral, and much more a Chriſtian Perſon, to be the Cauſe of the Death of two at once by their Neglect; ſo that we think with La Motte, when the Delivery is impracticable, that the Surgeon cannot acquit himſelf with a ſafe Conſcience to his Patient, without trying the Operation as the laſt poſſible Means of Relief.

Apparatus neceſſary for the Operation.

VII. If the unhappy Patient therefore ſubmits to the Operation, and the Surgeon thinks her able to go through it, he ſhould firſt have in Readineſs his Apparatus of Inſtruments and Dreſſing, ſuch as the ſtreight Inciſion Knife (*Tab.* XXX. *Fig.* 8.) or an Inciſion Knife, like thoſe uſed in common Diſſections,

Mercurius *Lib. de Arte Obſtetricandi. Cap. de Partu Cæſareo.* Ronhusius *Lib.* II. *Obſ. Chirurg.* 1. *de morb Mulier.* Rulovius *Lib. de Sect. Cæſar.* Lanckischius *Vid. Act. Erud. Lipſ. Ann.* 1693. *Pag.* 229. & *Miſc. Nat. Cur. Dec.* III. *Ann.* 2. *Obſ.* 17. *itemque.* Vateri *Diſſ. de Partu Cæſareo.* Saviardus *Obſ. Chirurg. Obſ.* 69 Jobertus *Diar. Erud. Pariſ. Ann.* 1692 and 1693. La Motte *de Art. Obſtetric. Lib.* IV. *Cap.* 12. Teichmeierus *in. Inſtit. med. Forenſis, Pag.* 18. and others, who aſſert the Operation to have been performed with Succeſs, the Mother happily ſurviving.

with

with another that is obtuſe pointed, repreſented in *Tab.* V. with Sciſſors alſo, obtuſe pointed, crooked Needles, and ſtrong Thread, as we directed in *Gaſtroraphia*, or ſtitching up of Wounds in the Abdomen, together with two or three Sponges, and ſome warm Wine in a Veſſel, not omitting the Dreſſing, conſiſting of ſcraped Lint, Plaſter, Compreſs, and Bandage, ſuitable to the Operation, with Reſtoratives for the Patient in caſe of fainting, Volatiles for the Noſe, and ſome Cordial to be given internally. All theſe being provided and rightly diſpoſed, the Patient's Bladder ſhould be emptied, leaſt by diſtention it ſhould be injured by the Knife, and the Patient then placed in the Middle of the Chamber upon the Bed, in ſuch a Manner, that the Operator and his Aſſiſtants may each perform their proper Office: The Patient ſhould then be incouraged with good and pious Words, and her Face covered from ſeeing the Inſtruments which might ſtrike a Terror. And laſtly, four ſtrong Perſons, at leaſt, are to be placed to hold the Arms and Legs, that the Patient may not move under the Operation.

VIII. The Surgeon ſhould then ſtand on that Side of the Patient which ſeems moſt convenient, and make a longitudinal Inciſion on the Outſide of the *Rectus* Muſcle between the Navel and Angle of the *Os Ilium*, where the Paracenteſis is uſually made in dropſical Subjects; the Skin and Membrane Adipoſa are to be divided for the Space of about eight or ten Fingers breadth, paſſing afterwards through the oblique and tranſverſe Muſcles, and then carefully through the Peritoneum, in which a ſmall Puncture ſhould be firſt made, and further divided by an Inciſion Knife that has an obtuſe Point (*Tab.* V.) or a Pair of Sciſſors, or in Defect of theſe, the Surgeon may introduce his Finger, and thereby defend and direct the firſt Inciſion Knife till the Opening appears large enough to extract the Fœtus; this done, the Surgeon is to ſearch where the Fœtus is lodged, and if it be without-ſide the Uterus, in the Cavity of the Abdomen, as it has been ſometimes found, it ſhould be immediately extracted, together with its After-burthen, without further Delay; but if the Fœtus be contained in the fallopian Tube, or in the Ovary, thoſe Parts are to be opened, and the Fœtus with its Placenta then removed; but if the Fœtus appears to be concealed in the Uterus, the Caſe is much more dangerous, becauſe of the great Hæmorrhage and Injury received by that Organ, the wounding of which has been obſerved from the moſt ancient Times to be extremely dangerous [a], eſpecially in Women with Child; but as there is no other way of taking out the Child, this is alſo to be opened by a longitudinal Inciſion ſufficient to give a Paſſage to the Fœtus and its Appendages. When the Fœtus and After-burthen have been this Way removed, the extravaſated Blood is to be diſcharged with Sponges that have been expreſſed out of warm Wine, and if the Flux be great, it ſhould be leſſened with Lint dipt in highly rectified Spirit of Wine, to be applied to the divided Orifices of the uterine Veſſels, and there compreſſed by the Fingers till the Hæmorrhage ceaſes, or is much abated. The Surgeon ſhould not be terrified at the conſiderable Loſs of Blood in this Operation, if the Patient be of a ſtrong Habit, becauſe it is often uſual for them to have violent Hæmorrhage in the natural Way of Delivery. After a ſhort Interval, to give the Patient time to recover her Spirits, the Lint is to be taken out of the Wound and the Abdomen cleanſed with Sponges; next the wounded Parts

Method of performing the Operation.

[a] *V.* Celsus, *Lib.* V. *Cap.* 56. and Bronius *de vuln. Lethalibus.*

are

are not to be ſowed together, but dreſſed with *Balſ. Capiv.* or the like, and left to Nature; for as the Uterus naturally contracts itſelf after Delivery, the wounded Parts will probably unite together [b].

Dreſſing after the Operation.

IX. The Wound in the Abdomen is to be joined together by two or three Sutures, as we directed before in *Gaſtroraphia*, leaving a little Space open at the Bottom for inſerting a Cannula or Tent to diſcharge the Matter and other Humours from the Cavity of the Abdomen, which ſhould be cleanſed by repeated Injections of ſome vulnerary Decoction, and thus it ſhould be continued till no more Matter is diſcharged, which is a Sign that the internal Wound is healed; after which the Threads of the Suture in the external Wound may be divided and extracted that it may be cicatrized. Authors generally adviſe the Patient to lie on her Back after the Operation; but if the Inciſion be made laterally, I think it better for the Patient to lie on her wounded Side, as we directed in Wounds of the Abdomen, by which Means the Matter may be diſcharged by Degrees, as it is made. Rossetus alſo adviſes a canulated Peſſary to be inſerted in the *Os Uteri*, to facilitate the Diſcharge of the Blood and Matter. In the mean time, a proper Diet and Regimen with internal Medicines ſhould be preſcribed to the Patient by ſome prudent Phyſician, till the Patient recovers, which in the Caſe of Lanciscius was ſix Weeks.

Extraction of the Fœtus from an Abſceſs.

X. A different Method is to be taken when the Fœtus endeavours to make its Exit, not by the natural Paſſages, but by ſome Abſceſs or Tumor in the Abdomen, and particularly in the umbilical Region, which has been frequently obſerved by Authors, and particularly by Cyprianus, and in *Annal. Acad. Juliæ*, 1727, where a Tumor or Abſceſs was formed in the Rectus Muſcle a little below the Navel, by which all the Parts of the putrid Fœtus, whoſe Bones I now keep by me, were extracted. In Caſes of this Kind, I think it moſt adviſeable to open the prominent Parts of the Tumor pointed out by Nature, under which the putrid Fœtus and Matter tormenting the Patient is uſually concealed, which being removed, the Ulcer may be cleanſed and healed as before; and if the Tumor has no apparent Suppuration, but the Patient is tormented with violent Pain in the Part, and the Tumor appears to contain ſomething preternatural, after weighing the Circumſtances of the Caſe in Conſultation with others, it ſhould be opened without Delay, cleanſed and healed without Suture as in other Abſceſſes.

When the Fœtus is contained in a Hernia, or makes its Exit by the Anus.

XI. When the Fœtus is lodged in a kind of Sacculus or uterine Hernia, according to the Obſervation of Senertus and Hildanus, but ſeldom occurs; an Inciſion is to be made through the common Integuments, and afterwards through the dilated Uterus and including Membranes of the Fœtus, which ſhould be then extracted, and the Remainder of the Treatment managed as before. In the Caſe of Sennertus and Hildanus, the Surgeon did not return the Uterus, but immediately ſowed up the Wound; ſo that I imagine the Uterus being incapable of a Reduction afterwards, was the Cauſe of the Mother's Death, when the Operation had been performed the Space of four Weeks, notwithſtanding the Fœtus continued alive and well; he would probably have ſucceeded better, if he had returned the Uterus a few Days after

[a] *Vid.* Bartholin, *Cent.* 6. *Obſ.* 92. Roonhuys, *Obſ. Chir. Lib.* II. *Pag.* 21. Solingen *Chirurg. Pag.* 776. *Vander* Wiel, *Pag.* 2. *Obſ.* 3. Mauriceau, *Obſ.* 251. *Obſ. Noſtra in Act. Acad. Natur. Curioſ. Vol.* I. *Obſ.* 176.

when

when it was contracted in a leſs Compaſs without making any Suture. If the Fœtus ſhould take its Courſe towards the Anus, the Bones making an Abſceſs and Paſſage into the Rectum [a], ſhould be carefully extracted with the Fingers or Forceps, and the Ulcer then deterged and healed by the Uſe of Injections and Balſams.

XII. The third and laſt Caſe, in which the Cæſarian Section may be uſed, is when *the Mother and Fœtus are both living* [b] but no poſſibility of a Delivery any other way, from ſome of the Cauſes mentioned at *N*° 4. eſpecially a bad Conformation of the Parts in the Mother, preventing the Surgeon from introducing his Hand [c]; in this Caſe, the Operation is alſo eſteemed barbarous and inhumane by the Generality of common People, and even ſome of the Profeſſion, who are prejudiced with a miſtaken Hypotheſis, by which they had rather loſe both Mother and Child by their Neglect, than ſave perhaps both of them by this Operation, which may be of eſpecial Conſequence in regal Families, where Peace and War, or the Devaſtation and Proſperity of whole Nations and Cities may depend on the Progeny. We therefore cannot help thinking it contrary to the Principles of Religion and a good Conſcience, for the Surgeon to deſignedly neglect the Operation, when all other Means can have no Effect, according to the old Maxim, *quem non ſervaſti, dum potuiſti, illum occidiſti*; or, to neglect ſaving a Perſon when it is in our Power, is to be acceſſary to his Death: Of two Evils the leaſt is to be choſe. But for the Operation itſelf, it is to be performed in the ſame Manner, as directed in *N*° 4. to 8. only more Caution ſhould be uſed for fear of wounding the living Fœtus. To revive the Fœtus which is almoſt ſpent in the Operation, it may be proper to fill its Mouth with Wine, or inflate the Fume of it up its Noſe, bathing its Noſe with *Aq. Hung.* and waſhing it with warm Wine: And after tying up the Navel-ſtring, and baptizing it, the reſt may be managed as we have directed in *N*° 2.

Third Caſe in which the Operation is to be uſed.

XIII. Though I ſtand up for the Operation in Caſes of the laſt Neceſſity, yet I am far from adviſing it, when there is a Poſſibility by any Means of avoiding ſo dangerous an Enterprize, by extracting the Fœtus through its natural Paſſages, though it could be done by no other Method then leſſening it or pulling it to Pieces, nor did I ever perform the Operation but when the Mother was dead. It is certainly better to preſerve the Mother, as a Tree, and deſtroy the Fœtus, as an irregular Branch, when its natural Birth is prevented from a bad Situation, too large a Size of Body, and particularly its Head, or from a monſtrous Conformation of its Parts, rather than hazard the Life of the Mother in ſo dangerous an Operation, to preſerve the Fœtus. I had alſo rather with SOLINGEN and LA MOTTE, when the Birth is prevented by a

Cautions.

[a] A large Quantity of Hair of a ſupriſing Length, and variouſly contorted together, has been very often found in the fallopian Tube, ſome Specimens of which I now keep by me; but as to the Cauſe and Manner of their Production, we are entirely in the Dark.

[b] In this Caſe, the Operation was firſt performed in *Helvetia*, *Ann.* 1500, as we are told by BAUHINUS *in Præf. de Fœtu exſect.*

[c] LA MOTTE will allow of the Cæſarean Section only in this Caſe, and on Condition that the Fœtus is living: Whereas, on the contrary, the general Advice is to perform the Operation, when the Fœtus may be reaſonably ſuppoſed to be contained in the Ovary, fallopian Tube, a kind of Hernia, or in the Cavity of the Abdomen, notwithſtanding it may be dead.

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Calloſity of the *Vagina*, or ſomething amiſs in the Mouth of the Uterus, prefer a Diviſion and Dilation of thoſe Parts to the Cæſarean Section, as much leſs dangerous; and the ſame may be alſo ſaid when the Vagina is obſtructed by the *Hymen*, or ſome other preternatural Membrane; but when the Calloſity of the Vagina is ſo large and hard as to render the Birth that way impracticable, if it was to be divided, there is then no other Means left but the Cæſarean Section.

When the Fœtus burſts out of the Uterus into the Abdomen.

XIV. If a Rupture of the Uterus ſhould be made in the Agonies of Labour, ſo as to let out the Fœtus into the Cavity of the Abdomen, the Poſſibility of which Caſe ſometimes happening is confirmed by many Obſervations [a], in that Caſe the Cæſarean Section may alſo be abſolutely neceſſary, as there is no other way of Delivery left, and without it both Mother and Fœtus muſt inevitably periſh in a ſhort Time. That the Fœtus is thus burſt out of the Uterus may be known partly from the Violence of the preceding Agonies, and ſtraining, to no Effect; the Pain afterwards ceaſing or remitting, and the Mouth of the Uterus being not at all or but little relaxed, as alſo from the Situation of the Fœtus and the Perception of the Mother, ſucceeded by trembling and great Tumor higher up in the Abdomen than uſual, which may be further confirmed by feeling, and the Appearance of great Pain in the right or left Hypochondrium, attended with fainting, raving, and convulſive Motions in the Mother. When theſe Signs appear, and the Fœtus does not appear to reſiſt as uſual againſt the Finger introduced in the Os Uteri, it may be reaſonably ſuppoſed to have burſt into the Cavity of the Abdomen. In this Caſe it will be neceſſary to make an Inciſion in that part of the Abdomen made moſt prominent by the Fœtus, which ſhould be then extracted as before. But when the Arm of the Fœtus hangs out of the ruptured Uterus, it is then extreamly difficult if not impoſſible to be aſſured of the Caſe by more than Conjecture from ſome of the forementioned Signs. It is in my Opinion inexcuſeable that the Operation ſhould be neglected, when this Caſe has been ſufficiently apparent, of which we have ſeveral Inſtances wherein both Mother and Fœtus have been loſt. The Operation is alſo neceſſary, when the Fœtus is generated not in the Uterus but in the Cavity of the Abdomen, which may be diſcovered from the Signs of Gravidation having preceded, the higher Situation of the Fœtus and Stricture of the Os Uteri at the Time of Delivery, with the other Symptoms beforementioned. But the Uterus is ſometimes ruptured in difficult Labour, ſo as not to exclude the whole Fœtus, but ſome Part only into the Cavity of the Abdomen; even a Leg may hang out of the *Os Uteri*, while the Head and Arms are excluded through the ruptured Uterus into the Abdomen, but in that Caſe the Cæſarean Section is not neceſſary. I myſelf once found the Arm of a Fœtus hanging out of the *Os Uteri*, while its Head was lodged in the Abdomen through the Rupture, and the reſt of its Body contained in the *Uterus*. Albinius and La Motte have alſo obſerved the Head of the Fœtus rightly diſpoſed to the *Os Uteri* and *Vagina*, while its Legs and Feet had perforated

[a] *Vide* Bartholin, *Cent.* VI. *Obſ.* 92. Rossetus, *Sect.* IV. *Cap.* IV. Schenckius, *Obſ. Lib.* IV. Hildanus, *Cent.* I. *Obſ.* 64. and 67. and *Cent.* IV. *Obſ.* 57. Roonhuys, *Obſ. Chirurg. Lib.* II. *Obſ.* 1. Solingen, *Pag.* 776. *Vander* Wiel, *Part* II. *Obſ.* 30. *Miſcel. Nat. Cur. Dec.* II. *Ann.* 7. *Obſ.* 10. and *Ann* 9. *Obſ.* 115. Salmuth, *Cent.* I. *Obſ.* 60. Mauriceau, *Obſ.* 251. *Diar. Erud. Pariſ. Ann.* 1722. *Menſ. Junio.* Loescher, *Diſſ. de Homine, Obſ.* 12. *Act. Natur. Curioſ. Vol.* I. *Obſ.* 176. Pistor, *de Fœtu e rupto utero in Abdomen prorumpente* 4° *Argent.* 1726.

the

the Uterus into the Abdomen near the Diaphragm; the Fœtus in theſe Caſes was extracted through the natural Paſſages by La Motte, but the Mother died a few Days after. On the contrary, I have an Inſtance given me by Rungius, where the Inteſtines of the Mother were plainly perceived by his Hand to fall down through the Rupture of the *Uterus* after the Child had been extracted, preſſing them back for ſome Time with his Hand from falling into the *Uterus*, till the latter had in ſome Meaſure contracted itſelf, the Patient happily ſurviving the Accident.

The Difference between Hyſterotomy and Embryulcia.

XV. The Difference between *Hyſterotomy* and *Embryulcia*, or the Extraction and Exſection of the Fœtus, ought to be here conſidered, becauſe they are frequently confounded, even by ſome of the Learned, and miſtaken for one and the ſame Thing. Embryulcia is the Extraction of the Fœtus by the natural Paſſages without any Inciſion, either in the Uterus or Abdomen; both which are divided in Hyſterotomy, or Extraction of the Fœtus by the Cæſarean Section. If we admit this Abuſe of the Terms, what Cipio Mercurius tells us may be in ſome Meaſure true, that the Exſection of the Fœtus was in his Time as common in *France* as bleeding for the Head-ach was in *Italy*. By ſuch a miſtaken Way of Speaking, even among knowing People, Women are intimidated and afraid to call in the Aſſiſtance of a Surgeon in difficult Births, for fear the Child is to be cut out of the Belly; whereas the Fœtus is generally extracted in thoſe Caſes, by nothing more than the Hands, and at moſt without any Pain by Inſtruments, through the natural Paſſages.

Whether the Cæſarean Section ſhould be made for a Fœtus when monſtrous.

XVI. As a monſtrous Fœtus, which conſiſts of two Bodies, two Heads, *&c.* cannot be delivered from the Mother entire by the natural Paſſages, it may be aſked whether the Cæſarean Section ſhould be made for it, to the Hazard of the Mother's Life, or whether the Fœtus may be leſſened, and ſo extracted in Pieces. Roonhuys is for the Operation; but for my own Part I muſt conſent with the univerſal Opinion, that it is better to deſtroy the monſtrous Birth than hazard the Mother's Life, and poſſibly deſtroy both.

Whether the Operation may be practiſed when the Head of the Fœtus will not paſs through the Vagina.

XVII. It may be again aſked, whether the Cæſarean Section may be performed, when the Head of the Fœtus is ſo large, and the natural Paſſages ſo ſtrait, that the Head is wedged in the internal *Os Uteri* or *Vagina*, ſo that it will neither move one Way nor another, uſually dying within three Days, which is deſervedly reckoned the moſt difficult Caſe in Midwifry, as both Mother and Fœtus are in danger of ſpeedy Death. Therefore, as the Head of the Fœtus cannot be held from its Slipperineſs and Narrowneſs of the Paſſages, and as the Hand cannot be introduced [a] to alter its Poſition in the Uterus, and as no Inſtrument can lay hold of the Head to extract the Fœtus without killing it; the Queſtion is on theſe Accounts ſtarted, whether the Cæſarean Section may be made to preſerve the Fœtus. It is the Opinion of moſt, that neither the Cæſarean Section nor leſſening of the Fœtus ſhould be made while either of them are living; but they had rather, according to the Opinion of the Roman Church, that both ſhould periſh, than that one ſhould ſurvive at the Expence of the other's Life; they alſo equally condemn the Cæſarean Section, notwithſtanding the many Inſtances of both ſurviving the Operation: Which

[a] As I have frequently found by Experience, with the Conſent of the beſt Practitioners in Midwifry, notwithſtanding ſome boaſt they can always invert the Fœtus with their Hands.

we are told by ROONHUYS was performed ſeven Times by D. SONNIUS, Phyſician at *Bruges*, upon his own Wife, with Succeſs both to the Infant as well as the Mother. The celebrated OLAUS RUDBECK is alſo ſaid to have performed the Operation with Succeſs upon his own Wife, the Fœtus alſo ſurviving. They will not therefore allow of extracting the Fœtus by Inſtruments[a], becauſe that hazards the Life of the Fœtus as much as the Cæſarean Section does the Life of the Mother. In this Difficulty, my Opinion is, that the Cæſarean Section ſhould never be performed on account of its great Danger to the Life of the Mother, but when it is ſtrictly commanded by a King or Prince, who is without Heir, to keep up the Line, in ſome of the Caſes mentioned at *N°* 12. eſpecially when the Mother is willing to undergo the Operation, to ſave her Infant. But without thoſe Conditions, the Surgeon ſhould rather wait as long as the Mother's Strength will permit, and endeavour to aſſiſt her Delivery with his Hands, till he preſumes the Fœtus to be dead, which may be then extracted with Inſtruments. But if the Fœtus be yet living, the Mother's Strength fails her, and malignant Symptoms are drawing on, while excruciating Pains make her cry out for the Surgeon's Aſſiſtance ; it is then better to ſave the Tree for future Productions, by a timely Extirpation of the offending Branch, than to loſe the whole by delay. If the Infant dies by the Operation, it is not done voluntarily but by Accident, to ſave the Cauſe (which is always greater than the Effect) to which, next under God, it owes its Being. Some will perhaps ſay cantingly, that it is againſt the fifth Commandment, *Thou ſhalt not kill* ; and that an Evil is not to be committed for the Production of Good, and the like ; but I think the Matter clear enough to obviate thoſe Quibles of itſelf, and ſhall therefore leave it. The Surgeon is ſo far from killing, that he moſt ſtudiouſly endeavours to ſave the Life both of the Fœtus and Mother ; but if both cannot be ſaved, it is better to ſave one than neither. More may be ſeen on this Subject in BECKERUS, *de Infanticidio licito ad ſervandam puerperam*, where theſe Objections are obviated at large, and the Caſe put in a clear Light. ROSSETUS has written learnedly and profeſſedly on the Cæſarean Birth : But thoſe who have not his Treatiſe, may ſee a Compendium of it in SCULTETUS's Explanation of the Table belonging to the *Sectio Cæſarea*, which in the *Francfort* Edition is *Tab.* XLII. but in that at *Amſterdam*, it is *Actuar.* I. *Tab.* X. *Pag.* 29.

CHAP. CXIV.

Of Herniæ or Ruptures in general, and particularly of the Umbilical, and its Method of Cure.

Of Ruptures in general.

I. THE generality of preternatural Tumors formed in the Abdomen, and particularly the Navel, Inguen, and Scrotum, by a Protuberance of the Inteſtines or Omentum, are uſually diſtinguiſhed by the general Name of

[a] The Extraction of the Fœtus by Inſtruments in impracticable Births is adviſed by RIOLAN, *Enchirid. Anat. Lib.* II. *Cap.* 28. and AMMANUS, *Med. Crit. Caſ.* VI. *Pag.* 26. DEVENTER, *loc. cit. Part* II. HORATIANUS, *Lib.* III. *Cap.* VI. SIGISMUNDA, *Lib. cit. Cap.* V. *aliique.*

Herniæ

Herniæ or Ruptures. Theſe Tumors differ firſt according to their *Place or Situation:* Thoſe formed at the Navel are called *Omphalocele* or *Exomphalos*; thoſe in the Groin *Bubonnocele*, and thoſe of the *Scrotum*, *Oſcheocele*, *&c.* They are alſo, ſecondly, diſtinguiſhed from the Body or Subſtance contained in or forming the Tumor: When from a Protuberance of the Inteſtines, they are called *Enterocele*; when from the *Omentum*, *Epiplocele*; if from Flatus or Wind, *Pneumatocele*; and if from Water, *Hydrocele*, *&c.* They are alſo diſtinguiſhable by Circumſtances leſs remarkable; as from their Size, being either ſmall, large, or enormous; from their Conſiſtence, being either hard, ſoft, fixed, or moveable, capable of being returned into the Abdomen or not, which latter are called *adheſive* Ruptures: Sometimes the Parts prolapſed are ſo confined by Stricture and Inflammation that the Flatus and Feces cannot be returned, which kind of Ruptures are called *incarcerated*; ſome are attended with Pain, others without, or with Sickneſs, Vomiting, and other bad Symptoms.

Deſcription and Kinds of the Omphalocele.

II. An *Omphalocele*, *Exomphalos*, or *Hernia Umbilicalis*, is a preternatural Tumor of the Abdomen at the Navel, from a Rupture or Diſtention of the Parts which inveſt that Cavity. Theſe Ruptures differ by their Size and Figure; ſome being ſmall, eſpecially when recent; others large, and ſometimes monſtrous: Some are of a round Figure, others acuminated or cylindrical; and I lately obſerved an umbilical Rupture in a Woman with Child, which reſembled the Size and Figure of the Penis, and was very painful, but contained nothing except Wind or Air. Umbilical Ruptures are again diſtinguiſhed according to their Contents; as if from the Inteſtines, *Entcromphalocele*; from the Omentum; *Epiplomphalocele*; if from Air or Wind, *Pneumatomphalocele*: Some of theſe Tumors are again diſtinguiſhed by their Conſiſtence, into hard or ſoft, returnable or not, painful or incarcerated, *&c.* Figures of theſe Ruptures have been exhibited by SCULTETUS, *Armament. Chirurg. Tab.* XXXVII.

Cauſes of an Exemphalos

III. Theſe Tumors ariſe from various Cauſes, but the immediate Cauſe is always ſome Force exerted upon the Abdomen, eſpecially near the Navel, ſuch as a violent and ſudden Motion, a Fall, violent Blow, or Leap, ſtrong Coughing or Sneezing, ſtraining to lift great Weights, difficult Labour in Women, and the like; by which Cauſes the *Peritonæum* at the Navel is either dilated, or ſometimes quite broke, as DIONIS obſerves, eſpecially when that Membrane is weaker or more relaxed than uſual. The dilated Parts at the Navel contain ſometimes the Omentum and Inteſtines, either ſeparate or together, and ſometimes only Wind or Flatus. A natural Weakneſs and Relaxation of the *Peritonæum* at the Navel, may be often the Cauſe of its being diſtended with the Inteſtines or Omentum in Children, eſpecially when aſſiſted by ſome Violence, as thoſe before-mentioned, or ſtrong Crying, which frequently produces this Diſorder, ſoon after the Birth, as I have ſometimes obſerved, eſpecially if the Abdomen and Navel-ſtring are not properly ſecured by rolling.

Diagnoſis.

IV. This Diſorder diſcovers itſelf both to the Eye and Touch, the Navel, appearing more prominent or protuberant than in its natural State, and the Tumor being preſſed with the Fingers uſually returns into the Abdomen, except there is an Adheſion, affording a Sort of flatulent Sound, eſpecially when the Patient is laid on his Back, which is a Sign that the Tumor ariſes from a Prolapſus of the Inteſtines. When the Tumor gives little Reſiſtance, and appears very ſoft, it may be reaſonably ſuppoſed diſtended with Flatus, or the Omen-

tum

tum only, though the latter is uſually accompanied with the Inteſtines, as it lies before, and is protruded by them; if upon returning the Inteſtines into the Abdomen the Tumor appears to be ſtill in ſome Meaſure diſtended, we may reaſonably conjecture, that it is alſo formed in part by the Omentum, which may be ſometimes returned, together with the Inteſtines. The Navel is alſo frequently obſerved to be greatly diſtended with Water in dropſical Subjects, remarkable Inſtances of which have been given and repreſented by SCULTETUS and PERMANNUS *Chirurgia Curioſa*, *Pag.* 330. *Tab.* V. but theſe Tumors are diſtinguiſhable from the reſt by the hydropical Habit of the Patient, and may be called *Hernia umbilicalis aquoſa*, as that containing Air may be termed *ventoſa* or *flatulenta*.

Prognoſis. V. The *Omphalocele* in Infants is uſually without Danger, and may be generally returned and cured without much Difficulty; nor is it to be judged dangerous in Adults, ſo long as the prolapſed Parts may be freely returned without any Adheſion; but if it proceeds from a Prolapſus of the Inteſtines through a very narrow Aperture, occaſioned by ſome Violence in Adults, ſo that it cannot be returned, there is then great Danger of a Mortification in the Inteſtines preceded by Inflammation, violent Pain and Vomiting, and ſometimes the iliac Paſſion, in which the Feces are voided by the Mouth; all which will probably terminate in the Death of the Patient. But when the Diſeaſe has advanced but ſlowly, and the Perforation in the Peritonæum is yet ſufficiently open to return the Inteſtines, the Patient is then in no great Danger, eſpecially if it be an Infant or Child. If no Aſſiſtance can be had immediately from the Surgeon to keep the Parts in their proper Situation, they ſhould be defended from the Cold, the Patient ſhould abſtain from violent Exerciſe, and live upon a ſpare, light, and animal Diet, which affords no Flatus. But when the Diſorder is become inveterate in an Adult, attended with the bad Symptoms before mentioned, we too often find by Experience, that the Operation itſelf will be to no Purpoſe, eſpecially if the Hernia be large, in which Caſe the Patient frequently dies, either in or ſoon after the Operation. When the Inteſtines are returnable into the Abdomen in Infants and Children, this Diſorder may be ſometimes cured by a proper Girdle or Bandage, Diet, and Regimen, ſo as to be in no danger of returning. If the Contents of the *Omphalocele* appear to be Wind or Flatus, there is little or no Danger; but if it contains Water, it threatens a conſequent Dropſy.

1ſt Method of Cure. VI. The Method of Cure is twofold, according as the Inteſtines are returnable into the Abdomen or not; if the firſt can be practiſed, it ſhould be done without any Delay, and the Parts ſecured againſt a future Relapſe. When the Surgeon therefore finds that the Aperture, through which the Inteſtines have been forced, is large enough for this Purpoſe, the Patient is then to be laid on his Back, and the Parts gently preſſed with the Hands and Fingers till he perceives they are returned; after which, the Remainder of the Treatment differs according to the Age of the Patient. In young Infants it may be frequently ſufficient, as I have experienced, to prevent a Return of the Inteſtines and Omentum by a Compreſs or Lump of *Empl. ad Herniam*, which being applied to the Navel, is to be retained by a Plaſter of the ſame Kind, over that a ſimple but thick Compreſs, with a common Linen Bandage of about three Fingers breadth, carried circularly round the Abdomen, obſerving to make it a little

a little tighter at every Dreſſing, by which Means a Cure may be often compleated in a few Weeks; but in a worſe kind of the Diſorder, I uſe a double Compreſs, putting a thin Plate of Lead into the leaſt and lowermoſt, binding it up on the Part as before. In Children, Adults, and old People, it will be neceſſary to uſe a kind of Girdle fitted with a Plate or Ball, as CELSUS obſerves, which are to be faſtened round the Abdomen to prevent a Relapſe of the Inteſtines or Omentum, repreſented in *Tab.* XXIV. *Fig.* 6. which is made of Leather, and the other at *Fig.* 7. of Steel; though there are ſeveral others of the like Kind, which are not contemptible in this Diſorder. See SCULTETUS, *Tab.* XXXVII. *Fig.* 6. But before an Inſtrument of this Kind is uſed, the Parts ſhould be firſt ſecured with a Cake of Emplaſter, Compreſs, and Bandage, as before, the Succeſs of which I have frequently experienced in young Subjects; but in Adult and old People this Inſtrument ſhould be wore through the whole Courſe of their Life, or they will be in continual Danger of relapſing upon any Violence, which they ſhould cautiouſly avoid.

The ancient Method of Cure.

VII. The preceding Method therefore appears upon Examination to be only a partial Cure in Adults, nor do we find any abſolute Method of curing the Diſorder, ſo as to prevent a Relapſe, deſcribed by any of our modern Surgeons except SAVIARD. We are informed by the excellent CELSUS, that the Ancients were very ſolicitous to remedy this Diſorder, for which they contrived various Methods, the chief of which we ſhall here tranſcribe for the Information of the Surgeon: He ſays "the Patient is to be firſt laid upon his Back, "that the Inteſtine or Omentum may be returned into the Abdomen, and the "umbilical Perforation being then empty, the Slit is to be tied together from "the Bottom with a Needle armed with two Threads, each of which are to "be faſtened with two Knots on oppoſite Sides of the Wound, by which "Means the Parts above the Ligature will be compreſſed, withered, and fall "off, and a firm Cicatrix formed beneath." Some make a longitudinal Inciſion before they undertake this Method, that by introducing their Finger the Inteſtine and Omentum may be thereby returned, and to prevent the Inteſtine and Omentum from being made faſt to the Wound. Others again cauterize the Parts, that have been thus ſecured, either with Cauſtics or the actual Cautery, to make the ſtronger Cicatrix; after which, they cure the Wound, like others, from burning, and this Method is not only the beſt, where there is a Rupture of the Inteſtine, Omentum, or both, but alſo in humoral Ruptures; but it requires the Patient to be of a good Habit, and neither an Infant nor an old Perſon: So far CELSUS agrees with the Obſervations that have been made by many of our modern Surgeons, in order to render the Cure of this Diſorder more perfect in Adults.

SAVIARD's Method.

VIII. SAVIARD, a Surgeon at *Paris*, had the Care of a little Girl of 14 Months old, who had an umbilical Rupture about the Size of a Gooſe Egg: After laying the Child on its Back, and returning the Inteſtines, he gave it to an Aſſiſtant to be held upright, and then tied up the Skin round the Bottom of the Tumor, with a Wax Thread folded four Times together: After two Days time he renewed the Ligature, whereupon the Tumor began to putrify; and in three Days time more he made a third Ligature tighter than either of the former, by which the Tumor was entirely ſeparated, and the Girl cured. The ſame Method was afterwards repeated with Succeſs upon another Girl, as he

informs us, in *Obſ. Chirurg.* 9. It is a little ſurprizing, that GARENGEOT takes no Notice of this Method of Cure; and SAVIARD himſelf does not inform us, whether the two Children were not curable by Bandage, and the more ſimple Method at N° 6. before he undertook this more ſevere Practice.

IX. If the Inteſtine cannot be returned, thro' the Straitneſs of the Aperture in the Peritonæum, but the Patient is tortured with violent Pain in the Part affected, with Vomiting and other bad Symptoms, to apply the Girdle or Bandage in that Caſe, would be not only uſeleſs but pernicious; the Patient ſhould be rather treated with emollient Clyſters and Cataplaſms, to relax the Parts and facilitate their Return; but if thoſe are not ſufficient, after they have been continued ſome Time, and the Inteſtine cannot be yet returned, it may be of great Service to the Patient to inject the Smoak of Tobacco by the Tube repreſented in *Tab.* XXXII. *Fig.* 12. inſerted in the Anus, till the Inteſtines are thereby relaxed and diſcharged of their Contents: From which *Clyſma Fumoſum* I have often experienced ſurprizing Succeſs. If the Patient is of a full Habit, and inclined to be feveriſh from the Pain and Inflammation of the Parts, it may be then proper to bleed, as in other inflammatory Diſorders, by which Means the diſtended Veſſels of the Inteſtine will be contracted, and probably afterwards be returned by a gentle Preſſure of the Hands, to be then ſecured with Compreſs, Bandage, and a proper Inſtrument as before.

Cured by Inciſion.

X. If the Diſorder continues four and twenty Hours, and becomes ſtill worſe after Bleeding and the Uſe of other Medicines, the Surgeon ſhould then immediately proceed to the Operation, without which there will be but ſmall Hopes of the Patient's ſurviving; and even then, if the Diſorder has continued above a Day and Night in a young Perſon of a full Habit, the inflamed Part of the Inteſtine will be probably found mortified, and the Operation of no Effect; but the Patient ſoon after expires, with a violent Vomiting, Weakneſs, and cold Sweats. For the Operation itſelf, it conſiſts chiefly in dilating the Wound of the Abdomen, ſo as to make it large enough to return the Inteſtine; in order to which the Patient ſhould be laid upon a Bed or Table, with his Head depreſſed, and his Abdomen or Back-ſide elevated, and being ſecured by Ligatures or the Hands of two or three Aſſiſtants, the Surgeon proceeds to make a tranſverſe Inciſion through the Integuments, which ſhould be held up in the oppoſite Part by an Aſſiſtant, taking Care not to wound the Inteſtine with the Scalpell, upon which Account it may be ſafer to make a ſmall Puncture, and inſert the Director *Tab.* I. *Lit. M. N.* under the Skin to guide the Knife; and if the Tumor be large, ſo that a longitudinal Inciſion be not ſufficient, a crucial Inciſion may be made, and the four Angles of the Integuments elevated carefully with the Knife and Fingers, ſo as not to injure the Inteſtine; after which the dilated Peritonæum, which immediately inveſts the Inteſtine, may be carefully elevated, and dilated with as ſmall an Inciſion as poſſible, which ſhould be done by guiding the Knife in a Director to avoid injuring the Inteſtine, which may be afterwards depreſſed and returned into the Abdomen, as we before directed. In treating of a Prolapſion of the Inteſtines by a Wound of the Abdomen, *Part* I. *Book* I. *Chap.* V. the Surgeon may avoid injuring the Inteſtine by dividing the Peritonæum with a Pair of Sciſſors, having obtuſe Points; or with a Scalpell that has a Button upon its Point, as in *Tab.* V. *Fig.* 3, 4, 5, or by otherways ſecuring the Point with his Finger,

which

which ſhould be conveyed with it into the Abdomen, till he has made an Opening large enough to return the Inteſtine.

New Inſtruments deſcribed.

XI. Inſtead of the preceding Inſtruments, to avoid injuring the Inteſtines in dilating the Peritonæum, modern Surgeons have contrived others more ſafe, and particularly the Director, *Tab.* XXIV. *Fig.* 8. furniſhed with a Pair of Wings, AA, to preſs down the Inteſtine while the Scalpell is directed in its Groove. To dilate Wounds of the Abdomen, which intercept and ſtrangle the Inteſtines, MORAND has contrived a Sort of Knife called a *Gaſtroraphic Biſtory*, *Tab.* XXIV. *Fig.* 9. which I forgot to mention in treating of Wounds of the Abdomen. This Inſtrument being inſerted into the Abdomen by its obtuſe or probe End, marked A, up to B, the two Handles CC, are then opened with the Fingers like a Pair of Sciſſors; and the moveable Arm D, having a ſharp Edge like a Scalpell on its upper Margin EE, the narrow Aperture is thereby divided or dilated, till it is large enough to return the Inteſtine. For the ſame Purpoſe, in Ruptures, LE DRAN has invented a kind of a latent Scalpell, *Tab.* XXIV. *Fig.* 10, 11. The firſt Figure ſhews the Inſtrument ſhut or concealed, but in *Fig.* 11. it appears open with all its diſtinct Parts; the Part AA, *Fig.* 10. is inſerted into the Foramen of the Peritonæum, to be dilated; and the Handle k being held in the right Hand, the Plate f is depreſſed with the Thumb, by which Means the Scalpell concealed in the Groove AA, is elevated as in *Fig.* 11. *lit.* CD, in ſuch a Manner, that the Point D always remains in the Groove, that it cannot wound or prick the Inteſtines, while the Edge between C and D divides the Peritonæum: But we ſhall give a more ample Deſcription of this Inſtrument in our Explanation of the XXIV^th^ Plate following.

The Dreſſing.

XII. When the Inteſtines have been returned by either of theſe Means, the Lips of the Wound are to be held and compreſſed by an Aſſiſtant, till they have been ſecured by the knotted Suture; after which it is to be dreſſed and healed, as we have before directed, in *Part* I. *Book* I. *Chap.* V. concerning *Gaſtroraphia*. After the firſt Dreſſing the Patient ſhould reſt in an eaſy Poſture for three or four Days, before it be again renewed, to promote the Agglutination of the Wound, unleſs ſomething forbid. After the firſt Opening, the Wound may be then dreſſed every Day, and retained with a ſtrict Bandage, as in other Wounds of the Abdomen; and when the Wound is healed, it will be ever after neceſſary for the Patient to wear a Girdle, to ſtrengthen the Parts, and prevent a Relapſe of the Diſorder; but if the Patient was an Infant or Child, the Parts frequently unite ſo firmly as to require no ſuch Aſſiſtance.

PETIT's Method of Cure deſcribed.

XIII. We ſhall, for the Satisfaction of our Reader, here tranſcribe the Method recommended by PETIT, as we find it briefly inſerted in the chirurgical Operations of GARENGEOT. Firſt, the Integuments upon the Tumor are to be elevated on one Side by the Hand of the Surgeon; and on the other, by an Aſſiſtant; after which a crucial Inciſion is to be made, and the Lips of the Wound are next to be raiſed or dilated, either with a Scalpell and Director alone, or aſſiſted with the Fingers: The Dilation of the Peritonæum then appearing, is to be carefully divided with a crooked Scalpell, and the Index, or elſe the middle Finger introduced, that the crooked and obtuſe pointed Sciſſors (*Tab.* I. *Fig.* D) may be thereby directed, to divide the Sacculus in a croſs Poſition; and if any Part ſhould be found to adhere preternaturally, as the Omen-

tum and Inteſtines ſometimes do, they are to be carefully ſeparated or divided by Inciſion. If now the Omentum does not appear to have fallen through the Ring of the Navel, it is a good Sign ; but if the contrary, and it appears much enlarged, the Diſorder is dangerous, whether it be returned or cut off; and notwithſtanding the prolapſed Inteſtines are often returned in this Manner, Death ſometimes follows ; yet they ought to be decently replaced, if the Aperture of the Peritonæum is large enough ; but if it is too ſtrait, it ſhould be dilated with a Scalpell, armed with a Button at the Point, as in *Tab.* V. *Fig.* 3, 4, 5. which being introduced, is to be directed obliquely upward and towards the left Part of the Abdomen, to make the Dilatation ; but if the Hernia or Tumor is not very large, PETIT's Method is then to dilate the Peritonæum without Inciſion, and to return it together with the Inteſtine ; but in what Manner he dilates the Aperture of the Peritonæum without Inciſion, he does not acquaint us, nor can I eaſily imagine.

The Dreſſing uſed by PETIT.

XIII. After the Operation he proceeds to a Deligation and Cure of the wounded Parts : This he orders to be done without Suture, by a Ball of Linen, which he calls a Pellet, dipt in the White of an Egg, and being faſtened to a Thread is applied to the Foramen, through which the Inteſtines were prolapſed ; the reſt of the Wound is then filled with Bits of Linen rolled up with Cylinders of ſcraped Lint, in French *Bourdonnets* ; and anointing the external Parts of the Wound with Oil of Roſes, three or four Compreſſes one larger than another are applied over the whole, and retained by the Napkin and Scapulary. The next Day he directs the Pellet or Ball to be removed from the Aperture of the Wound, notwithſtanding its firm Adheſion ; after which, he tells us there remains no Veſtigia or Appearance of the late Foramen or Wound ; but how the reſt of the Wound is afterwards to be healed, he does not tell us. For the reſt of the Cure, eſpecially for the firſt Days, Bleeding, Clyſters, and a proper Diet, are judged greatly to contribute.

The Opinion of DIONIS examined.

XIV. DIONIS, in his Surgery, tells us, that the *Exomphalos* never proceeds from a Dilatation, but a Rupture of the Peritonæum ; and that therefore the Inteſtines are not to be found near the Cutis and Integuments, nor lodged in a Sacculus, according to the received Opinion. But that DIONIS is greatly deceived in this Notion, may appear from the forecited Obſervations of LE DRAN, publiſhed *Ann.* 1722. *Pag.* 188. as well as from an Obſervation of my own. During my Profeſſorſhip at *Altorf*, a Nobleman of a luſty and obeſe Habit had an Exomphalos, as repreſented in *Tab.* XXIV. *Fig.* 12. where the Letters AAAA denote a kind of large Ring in the Integuments or near the Navel, in which was contained the Peritonæum dilated and pellucid, through which might be ſeen the Inteſtines BBB in the living Subject. So long as the Patient wore a Girdle, with a hard Compreſs or Pillow upon the Part, repreſented in *Tab.* XXIV. *Fig.* 6. the Inteſtines remained in the Abdomen in their natural Poſitions ; but upon removing the Supports, the Inteſtines immediately protruded into the thin Membrane, forming a Sort of Bag, protuberant at the Navel. It is probable, other Surgeons and Phyſicians may have made Obſervations of the like Kind ; and at leaſt, I have GARENGEOT and PALFYN agreeing with me in oppoſition to DIONIS, who both affirm that the Inteſtines are contained in a kind of Sacculus or Dilatation of the Peritonæum. But we are not totally to deny, that the Opinion of DIONIS may ſometimes be true ; for ſome Caſes have been

been doubtleſs obſerved, as well in dead as living Subjects, where the Inteſtines have not been confined in a Sacculus of the *Peritonæum*, but protruded under the Integuments, through a Rupture of that Membrane. However, the Surgeon ſhould be careful not to be impoſed upon, by miſtaking the Inteſtine itſelf for the Sacculus, the wounding of which would perhaps be fatal.

An EXPLANATION *of the* TWENTY FOURTH PLATE.

Fig. 1. The *Trocar*, conſiſting of a triangular pointed ſteel Bodkin, included in a ſilver Cannula, ſerving to tap or perforate the Abdomen and Scrotum in dropſical Patients. A, its Handle; B, its triangular Point; CC, the including Cannula or ſmall Pipe.

Fig. 2. and 3. is the ſame Inſtrument aſunder; BC, the ſteel Bodkin that makes the Perforation; A, its Handle (*Fig.* 3.) is the ſilver Cannula or Tube; AA, the Part to be inſerted into the Abdomen. C, Two oval Apertures on each Side, that the Water may enter not only at the End but on each Side; BB, a round Plate, with two ſmall Holes, by which it may be faſtened to the *Abdomen*. D, the Orifice of the Tube, by which the Water is diſcharged.

Fig. 4. Repreſents another kind of Cannula for the ſame Purpoſe invented by PETIT. AA, a long Slit in the Cannula in its upper Part, which the Inventor ſuppoſes will promote the Diſcharge of the Water. B, the Aperture, by which the ſteel Bodkin enters, and the Water is diſcharged. CC, another Plate made hollow like a Gutter, by which the Water is conveyed down into ſome Receptacle.

Fig. 5. Is an Inſtrument for the crooked or hump-back made of Steel, in the Form of a Croſs. AAAA, the cruciformed Part, which is applied to the Back and Shoulders. BB, a ſteel Collar for the Patient's Neck, which ſhould be lined with Silk or Leather, and may be taken up or let out by the Claſp aa. CC, are two Girts of Leather, to be faſtened round the Shoulders, the Left being open to ſhew the ſmall Holes, by which it is to be faſtened with a tagged Lace, the right ſhews the Manner it is to be faſtened to the Shoulders. EE, is a Girdle paſſed through the Holes f, to be faſtened round the Waiſt.

Fig. 6. Repreſents a kind of Belt for depreſſing the umbilical Rupture; A, is a ſteel Truſs covered with Leather or Linen Cloth, which is to be applied to the Navel upon Cotton, over the Compreſſes and Plaſter, being furniſhed with a Protuberance or Button in its Middle, repreſented at D. BBB is the Girdle of Leather or Linen Cloth faſtened by the Buckle C.

Fig. 7. Is another Inſtrument for the ſame Purpoſe, made of ſtrong Braſs or ſteeled Wire, bent in the particular Manner here deſcribed; A, the Part applied to the Navel BB, goes round the Abdomen, and CC are applied to each Inguen, and thus by the Elaſticity of the Inſtrument the Navel and Abdomen are compreſſed: Before it is uſed, it ſhould be covered with ſoft Leather or Callico, and the Part ſhould be filled up with boiled Horſe-hair, or ſuch other like Subſtance, and the whole is to be adapted to the Size of the Patient.

Fig. 8. Is a Director to guide the Knife and prevent it from injuring the Inteſtine in the Operation for Hernia's. AA, two Plates in the Form of a Heart to preſs down the Inteſtine, that it may not be wounded by the Edge of the Knife.

Fig. 9. The Gaſtroraphic inciſion Knife of MORAND, to be uſed in the ſame Caſe with the preceding. A, is the obtuſe or probe End to be inſerted into the Abdomen; B, the Hinge, by which the two Parts of the Inſtrument are joined; CC, the Handles for the Fingers; D, the moveable Arm of the Inſtrument, which is round and obtuſe in its lower Part, but with a ſharp Edge EE upward, by elevating which the Parts are to be divided and dilated.

Fig. 10, 11. Repreſents the Seapellum Herniarium or Biſtory of LE DRAN. The firſt repreſents it cloſe, but *Fig.* 11. ſhews it open, that its internal Structure may be better perceived; AA, a hollow Director, in which is concealed the ſmall inciſion Knife C, which is in the open Figure elevated out of its Groove; BD, the Point of the Scalpell, which moves in the Groove, being faſtened, that it cannot ſlip out; EE, the Leaver, which elevates the Scalpell; F, the Handle of the Leaver, which is depreſſed by the Thumb to elevate the Scalpell; G, a ſteel Spring, which elevates the Leaver when it is not preſſed by the Thumb, by which Means the Scalpell is again concealed in the Groove; BHH, two lateral Wings, which cover and defend the Inteſtine; II, two exact Wings, which include and ſuſtain the Leaver; K, the Handle of the whole Inſtrument; L, the Screw upon which the Leaver turns.

Fig. 12. Repreſents a large Tumor or *Hernia Umbilicalis*; AA, the Skin of the Navel very much diſtended in the Form of a Ring, above two Inches diameter, in which appeared a thin pellucid Membrane, the Peritonæum, through which might be ſeen the ſmall Inteſtines BBBB contained in the Abdomen.

CHAP. CXV.

Of other HERNIÆ, *and particularly thoſe of the Abdomen, or the* HERNIA VENTRALIS.

Hernia Ventralis deſcribed, with its Kinds.

I. WE have already obſerved, that a Protuberance at the Navel cauſed by the Inteſtines or Omentum, is termed *Omphalocele* or *Hernia Umbilicalis*; but when the Inteſtines or Omentum cauſe a Tumor in other Parts of the Abdomen, it is differently denominated: *Oſchiocele*, when in the Scrotum; *Hernia Inguinalis*, when in the Groin; *Cruralis*, when in the upper and anterior Part of the Thigh; and *Ventralis*, when in any other Part of the Abdomen; as is ſometimes obſerved in the *Linea Alba*, either above or below the Navel. Theſe *Herniæ* are uſually diſtinguiſhed into *true* and *ſpurious:* The true are thoſe formed by a Prolapſion of the Inteſtines or Omentum: The Spurious are thoſe formed by other Bodies, as the *Hydrocele*, *Sacocele*, *Varicocele*, &c. We ſhall firſt conſider the *Hernia Ventralis*, which has been either ſlighted or wholly neglected by the chirurgical Writers of the laſt Century; but as the Diſorder is not only deſcribed by the Ancients, but alſo frequently occurs in our own Time, ſome Inſtances of which I have had myſelf, it will be agreeable to our Undertaking to conſider it particularly in this Place. As to their Difference, ſome are large, others ſmall, and ſeated either in the Middle or on the right or left Side of the Abdomen: Some are eaſily returned again into the Abdomen, attended with no Inconvenience; others cannot be returned, are attended with grievous Symptoms, and are therefore called incarcerated.

II. With

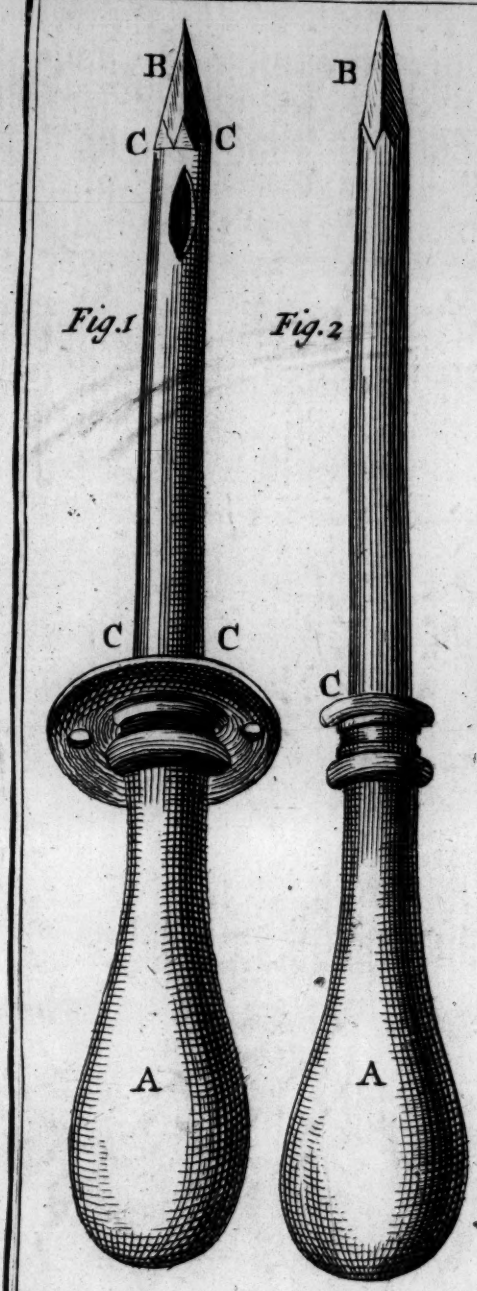

Fig.1

Fig.2

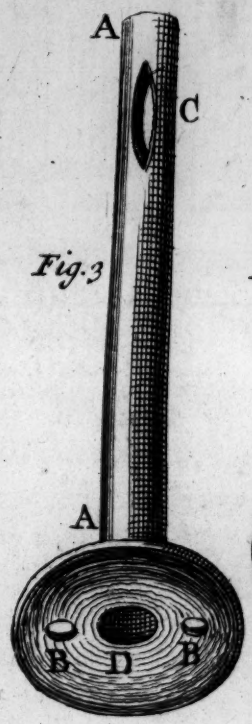

Fig.3

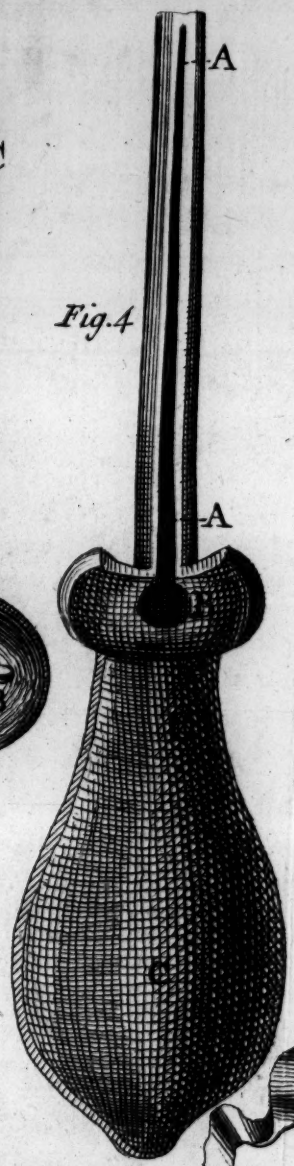

Fig.4

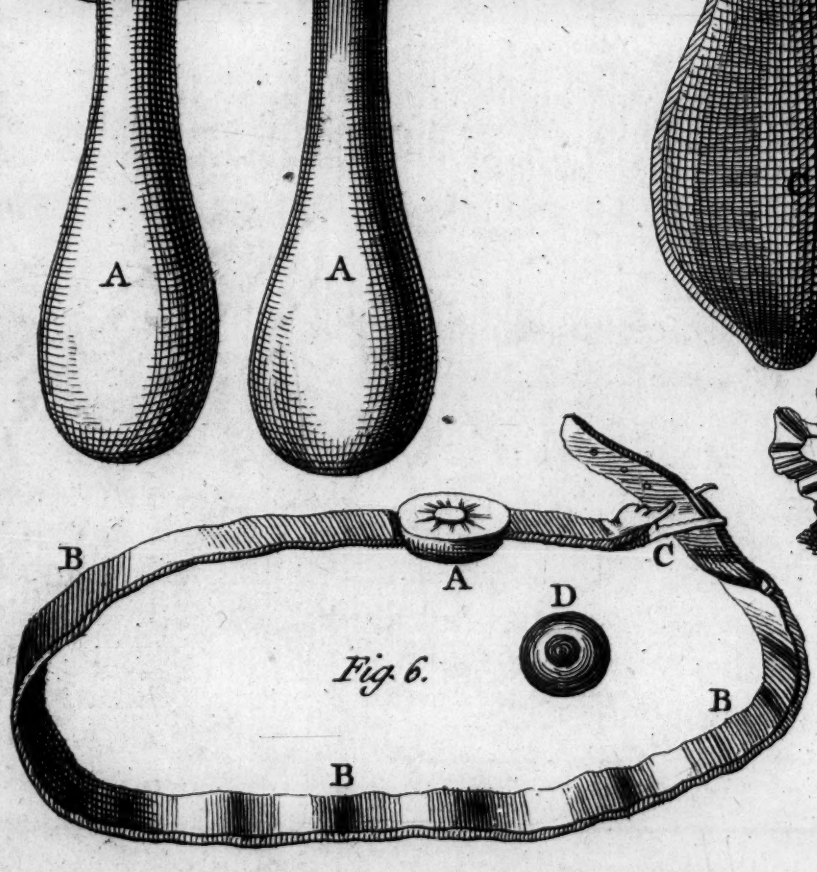

Fig.6.

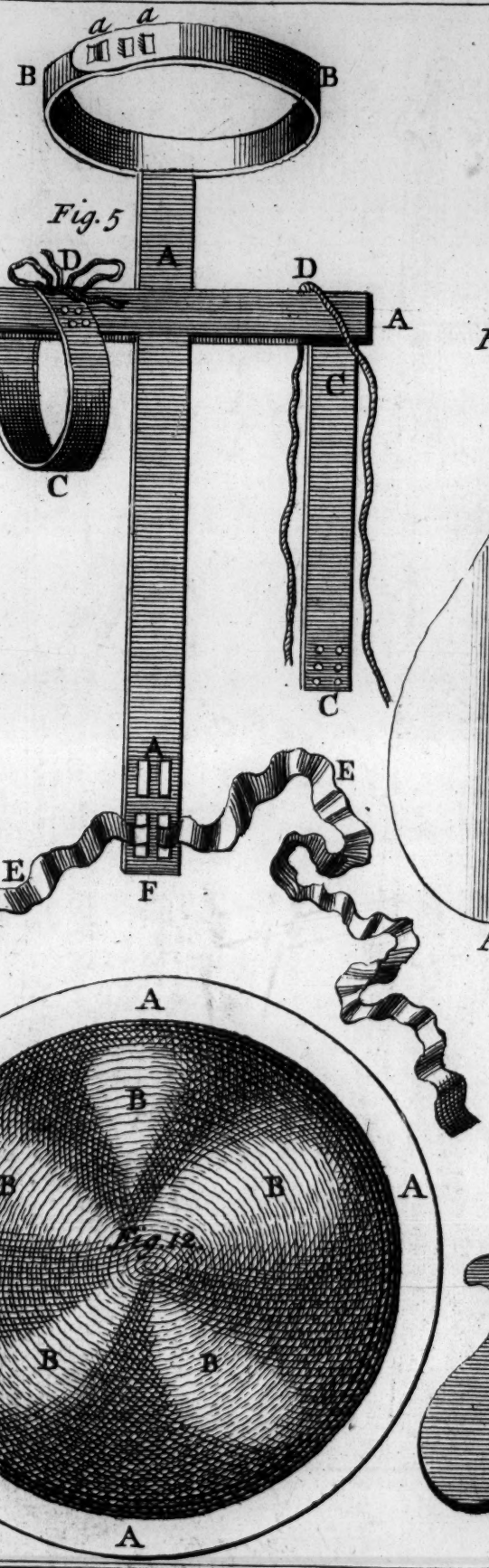

Fig.5

Fig.12.

Fig.8

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Fig. 9
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Fig. 10.
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Fig. 11.
C
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Fig. 7
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C

J. Mynde sc.

II. With regard to the Cauſes of theſe Diſorders, there are two Opinions: DIONIS and others will have them proceed from a Rupture of the *Peritonæum* by ſome violence, whereas GARENGEOT will have them to proceed not only from a Rupture of that Membrane, but more frequently from a Dilatation of the *Peritonæum*, when it is not equally preſſed by the abdominal Muſcles, through a Wound, Relaxation, or other Defect, eſpecially in the tranſverſe Muſcles; ſo that by the ſtronger Action of the other Muſcles the Inteſtines are forced, and the Peritonæum dilated in that part where there is the leaſt Reſiſtance. Cauſes.

III. A *Hernia Ventralis* may be diſcovered from the Tumor and Inequality of the Integuments more in one Part than in another; the Tumor itſelf gives Way to the Preſſure of the Hand and returns into the Abdomen, but upon removing the Hand it returns again with a Sort of murmuring Noiſe; when the Patient coughs, breathes deep, or ſtrains, in lifting any Weight, or going to ſtool, the Tumor then increaſes and affords a greater Reſiſtance to the Touch; but in the incarcerated Kind, when the Inteſtine cannot be returned the Diſorder is alſo accompanied with the Symptoms belonging to the *Omphalocele* or *Hernia Umbilicalis*: To which we may add, that the Diſorder is common to Subjects of all Ages, appearing not only in Infants and Children, but more frequently in Adults. Diagnoſis.

IV. It may be here proper to caution the Surgeon, leſt he ſhould miſtake this kind of Rupture for an Abſceſs in the Abdomen, and proceed raſhly to open or treat it accordingly. That ſuch a Miſtake may be eaſily made by the unſkilful, I am convinced, from an Inſtance within my own Knowledge, in which a Surgeon intended to have opened one of theſe Tumors as an Abſceſs, and have probably cut through the ſubjacent Inteſtines as well as the Integuments of the Abdomen, if I had not better informed him and perſuaded him to the contrary. When the Diſorder is of long ſtanding in Adults, and eſpecially in old People, the Cure of this Diſorder is very difficult, as it alſo is hardly ever cured, when occaſioned by a Wound of the Abdomen, becauſe the Peritonæum is then wanting. If the Aperture of the Peritonæum be ſmall and contracted, ſo as to compreſs the prolapſed Inteſtine, the Caſe is very dangerous, as in umbilical Ruptures, being frequently attended with moſt acute Pain, Inflammation, Vomiting, and even the iliac Paſſion; and if the Inteſtines come through the *Linea Alba* above or below the Navel, the Diſeaſe is univerſally allowed to be almoſt incurable; but as the Opening of the Peritonæum is uſually larger in theſe than other Ruptures, they are on that Account generally eſteemed leſs dangerous. Prognoſis.

V. Though this kind of Rupture may be attended with many bad Symptoms from the Diviſion of the Peritonæum and Stricture upon the Inteſtines, if left to itſelf, yet if it be recent, and in Infants or Children, there is no doubt but it may be remedied, or at leaſt alleviated by the Aſſiſtance of Art. In this Caſe, the Girdle at *Tab* XXIV. *Fig.* 6. will be found of the greateſt Benefit, eſpecially if the Compreſs marked A, be ſufficiently large, and conſtantly retained upon the Part, ſecured with a Plaſter and proper Dreſſings: Which Inſtrument will be alſo of great uſe to Adults, to prevent the Diſorder from growing worſe, when of long ſtanding, and incurable. We learn from CELSUS [a], that Cure.

[a] *Medic. Lib.* VII. *Cap.* 17.

the

the Ancients had a Method of curing theſe Ruptures, like thoſe of the Navel (N° 7.) preceding, by Ligature; and when the Parts mortified and fell off, they united the Lips of the Wound by Suture, and cured it as other Wounds. But I can by no Means approve of ſuch a Practice, as the Inteſtine itſelf may be tied up with the Integuments and mortified with them. The moſt rational Method will be to dilate the Peritonæum by Inciſion, return the Inteſtine, and manage the whole as in the *Omphalocele*; which has been practiſed with Succeſs by PETIT, on a Taylor, who was well within five Days after the Operation. An Example of a ventral Hernia, after the Cæſarean Section, may be ſeen in SAVIARD, *Obſ. Chirurg.* 59.

CHAP. CXVI.

Of the BUBONOCELE *or* HERNIA INGUINALIS.

Bubonocele deſcribed.

I. A *Bubonocele* is a Tumor in the Inguen formed by a Prolapſus of the Inteſtines, Omentum, or both, through the Proceſſes of the Peritonæum and Rings of the abdominal Muſcles. The Tumor is generally formed by a Prolapſion of the ſmall Inteſtines, but I have ſometimes known it from the Colon and Cœcum, eſpecially in the right Inguen. Not only Men but Women are alſo ſubject to this Diſorder, in which latter the Inteſtines have come down ſo low as to be even with the *Labia Pudendi*. Theſe Ruptures are ſometimes formed in part by the Bladder, eſpecially in gravid Women, according to the Obſervation of RUYSCH, PETIT, and others; the Uterus itſelf has been alſo obſerved by HILDANUS and RUYSCH, to make part of theſe Tumors; great Care ſhould be therefore taken to diſtinguiſh theſe Ruptures from Bubo's, and other Tumors, or Abſceſſes, leſt by wounding theſe Parts the Patient's Life might be endangered.

Cauſes.

II. The Bubonocele may ariſe from two Cauſes like the *Exomphalos*, either a Relaxation of the Peritonæum and Rings of the abdominal Muſcles, or from ſome violent Contraction and Preſſure of the abdominal Muſcles upon the Inteſtines, as in jumping, lifting great Weights, coughing, hallowing, blowing a Trumpet, riding on Horſedack, ſome Fall or Blow, violent Vomiting, difficult Birth, *&c.* by which Means the Peritonæum is either lacerated, or according to the general Opinion of the Moderns [a] ſo far dilated, as to let through the Inteſtines, Omentum, or both. Sometimes only one Side or Cell of the Inteſtine is preſſed through the Peritonæum, according to the Obſervation of LITT. *in Act. Acad. Pariſ. Ann.* 1700. MORGAGNI *in Adv. anatom.* III. p. 8. and 9. and RUYSCH *in Adverſ. Anat. Dec.* II.

[a] Many, and I believe, the greateſt Part, of our modern Surgeons (particularly HILDANUS, *Epiſt. de Hernia Uterin.* NUCK, *Exper. Chirurg. Cap. de Hern. & Adenograph*, p. 171, and RUYSCH, *Obſ.* 18. *Adverſ. Anat. Dec.* II. *aliique*) are of Opinion that the Peritonæum does not burſt, but is only dilated in theſe Ruptures. But though their Opinion is oftner true than the other, yet the Peritonæum is ſometimes ruptured by great Violence, as ÆGINETA obſerves, *Lib.* VII. *Cap.* 65 which is alſo confirmed by the Obſervation of ROSSETUS, BARBET, and GARENGEOT, as well as myſelf.

III. When

III. When this Diſorder is formed inſenſibly, and by Degrees, it is attended with but few and ſlight Symptoms; and in this Manner it uſually ariſes from taking Cold, violent Exerciſe or Straining, eating too plentifully of groſs and flatulent Food, as I have ſometimes obſerved, which will frequently exaſperate the Diſorder, ſo as to ſtrangle the Inteſtine in the Aperture of the Peritonæum, that its Contents can have no Paſſage; the Conſequence of which will be violent Pain and Inflammation, Sickneſs, Vomiting, and the iliac Paſſion, to which Symptoms thoſe are always expoſed, who have an Oſchiocele or Prolaption of the Inteſtines into the Scrotum. Therefore ſuch as have a Rupture at the Navel, Inguen, or Scrotum, ſhould be careful not to go without a proper Truſs, which would endanger them of relapſing into a worſe kind of Diſorder from the Cauſes here mentioned; though it muſt be confeſſed, that ſuch as are guarded with a Truſs, do ſometimes relapſe in violent Riding or other Exerciſe, in which the Truſs is either broke, looſened, or diſplaced, and the Inteſtine falls down, as formerly happened to the *French* Duke and Martial DE VILLEROI in hunting, not without endangering his Life, as DIONIS mentions. Symptoms.

IV. The *Hernia Inguinalis* may be diſcovered from the Tumor thereby occaſioned in the Groin, which proceeds up to the Ring of the abdominal Muſcles, and when the Inteſtine is not incarcerated or impriſoned, but returnable into the Abdomen, the Tumor ſubſides upon lying down, and in other Poſtures. Upon preſſing it with the Hand the Tumor feels ſoft, with an equal Reſiſtance, as if one touched the Inteſtine diſtended with Wind, which frequently aſcends into the Abdomen with a murmuring Noiſe; but when the Omentum forms the Tumor, it has a greater Reſiſtance, and cannot be eaſily returned. When the Hernia Inguinalis is incarcerated, ſo that the Parts forming the Tumor are not returnable into the Abdomen, it uſually appears with a greater Reſiſtance to the Touch, Redneſs, and Inflammation, the Patient being troubled with intenſe Pain, and a Fever, followed by a violent Vomiting and the iliac Paſſion, to ſuch a Degree, that the Patient is thereby ſpent, and ſometimes periſhes in a cold Sweat, for want of timely Relief. Diagnoſis.

V. Theſe Ruptures are often attended with Danger, eſpecially the incarcerated, in which, if the Inteſtine be not timely returned, but the Stricture continues two or three Days, red and livid Spots appear upon the Tumor, which denote a Sphacelus or Mortification, and if an univerſal cold Sweat ſeizes the Patient, he has generally but a few Hours to live. In this Caſe, many prudent Surgeons omit the Operation as uſeleſs, to avoid Reflections, as being inſtrumental to the Patient's deceaſe; but when the Diſorder is recent, the Symptoms mild, and the Patient ſtrong, the Surgeon need not be then ſo haſty to perform the Operation. When the Omentum alone falls down, there is leſs Danger, than when it is accompanied with the Inteſtines; though the Symptoms of an incarcerated Bubonocele have been ſometimes obſerved, when the Omentum has been found in the Rupture, upon dividing it. When the Redneſs and Reſiſtance of the Tumor goes off, and it turns livid or black, the Patient being troubled with inceſſant Vomiting, weak Pulſe, *&c.* it is a ſure Sign that the Inteſtine is mortified alſo. When the Inflammation is communicated from the Inteſtine to the other Viſcera, and the Abdomen appears diſtended, there is then little or no Hopes left of the Patient's Recovery. Laſtly, Prognoſis.

if

if the prolapſed Inteſtine adheres to other Parts, ſo as to require the Operation, the Caſe is then alſo doubtful and precarious; the Operation itſelf being ſometimes impracticable, eſpecially in the crural Rupture, where it ſometimes adheres to the Artery or Vein, as GARENGEOT has obſerved. The Notion therefore, that the ancient Phyſicians never practiſed this Operation, ſeems in my Opinion to be true, as we find no Account thereof, either in CELSUS, ÆGINETA, or others. But as the Operation may be frequently, though not always ſucceſsful, I think no Time ſhould be loſt before it is put in Execution.

Method of Cure when the Inteſtine is returnable

VI. When the Inteſtine is returnable, the Patient ſhould be laid on his Back, and his Thigh a little bent to relax the Integuments; then the Tumor is to be gently preſſed or returned with the Hands and Fingers, after which a Plaſter and Compreſs are to be applied to the affected Part, retained with a proper Truſs or Bolſter, and Girdle or Bandage, ſeveral of which are exhibited in *Tab.* XXV. By keeping the Parts preſſed cloſe together in this Manner, without taking off the Truſs for ſeveral Months, a perfect Cure is frequently obtained, eſpecially if the Diſorder was recent, and in an Infant or Child; and even in Adults, the ruptured Parts become ſo contracted, as not to admit a falling down of the Inteſtine, if they are not perfectly cloſed. And this Practice hardly ever fails of Succeſs in any that are under twenty Years of Age; ſo that there is no occaſion to ſubject the Patient to the Torture of dividing the Parts by Inciſion, when this milder Method will equally or better ſucceed; but Patients who are advanced in Years, ſhould never leave off the Truſs, nor perform any violent Exerciſe, if they are deſirous to prevent a Return of the Diſorder.

CHAP. CXVII.

Of the Hernia Inguinalis incarcerata, or intercepted BUBONOCELE.

Method of Cure when the Parts are not returnable.

I. WHEN the prolapſed Parts in the Rupture are ſo incarcerated or intercepted, that they cannot be returned into the Abdomen by the Hand of the Surgeon, whether it be from the Inteſtines coming through the Rings of the abdominal Muſcles, or from a Stricture in the Sacculus of the Peritonæum, the Surgeon muſt then proceed to the Operation of dilating the Parts by Inciſion as before in the Omphalocele; but he may firſt try to reſtore the Parts by more gentle Means, as the repeated Uſe of Cataplaſms, Ointments, and laxative Clyſters, after bleeding, whereby the Stricture is ſometimes removed, the Parts relaxed, and the Inteſtines may be returned by the Fingers without much difficulty. In order to which, the Patient having made Water, is to be laid on his Back with his Head inclining, his Hips elevated, and his Thigh a little bent inward; the Inteſtines are then to be gently preſſed in a circular Direction towards the *Os Ilium*, from whence they proceeded, and being returned, the fiſſured Parts of the Abdomen are to be compreſſed by the Hand of an Aſſiſtant, till the Dreſſings are applied; to wit, a Plaſter, and thick Compreſs of a triangular Figure, firmly ſecured upon the Part by a leather Girdle, or the Bandage called *Spica Inguinalis*, which ſhould not be left off by the Patient for many Years, and if he be old it ſhould be wore during Life. I have ſometimes

times known a Clyſter of the Smoak of Tobacco ſucceed in relaxing the Parts, when others have failed; the Inſtrument for adminiſtring which we ſhall deſcribe in treating of Operations belonging to the Anus. This laſt kind of Clyſter particularly ſucceeded, when others were of no Effect, in a Man, who had laboured under an incarcerated Bubonocele, with all its malignant Symptoms, for the Space of three Days, when the Patient was ſuppoſed by every one to be near dying; and I have ſince returned many other Ruptures by the ſame Practice, ſo that I have never yet had occaſion for the Knife in this Diſorder [a]. Some recommend the Application of Cloths dipt in cold Water, which, if the Diſorder be recent, may ſometimes ſucceed; but in ſome Caſes may be dangerous, as promoting a Sphacelus [b].

Cure by Inciſion.

II. When the Surgeon perceives that it is impoſſible to return the Inteſtine, and finds by the great Inflammation, Pain, and Vomiting, that the Diſorder will be fatal, he ſhould acquaint the Patient and his Friends with the great Neceſſity there is for him to undergo the Operation, to prevent a Mortification and conſequent Death. When the Patient has ſubmitted to the Operation, having diſcharged his Urine, he is to be laid on his Back upon a Table, or on the Side of his Bed; the Inguen ſhould be alſo ſhaved, that he may meet with no Obſtruction; the Patient's Head being then inclined, his Hips elevated, and Thigh a little inflected, being ſecured or held firm by an Aſſiſtant, the Integuments are next to be taken up on each Side the Tumor by one Hand of the Surgeon and another of the Aſſiſtant, while he makes a longitudinal Inciſion with a Scalpell upon the Middle of the Tumor, after which he is to dilate or remove the Sides of the Wound from each other; but if the Integuments cannot be thus elevated by reaſon of the violent Inflammation, the Surgeon ſhould then graſp the Tumor between the Thumb and Fore-finger of his left Hand, making the Inciſion downward, in a right Line, and with a light Hand, that he may not divide deeper than the Skin, ſo as to injure the Inteſtine: A Director is then to be introduced between the Tumor and divided Skin, and the Wound is to be enlarged upward and downward by an inciſion Knife or Sciſſors; after which the Sides of the Wound are to be drawn aſunder by Hooks or the Fingers, and the remaining Part of the *Membrana Adipoſa* carefully divided, till the Inteſtine or its Sacculus of the Peritonæum appear to view. GARENGEOT tells us, that the modern *French* Surgeons divide the Membrana Adipoſa not perpendicularly with an obtuſe Inſtrument, but obliquely with a Scalpell, till the Sacculus of the Rupture appears; but this ſhould be done with great Circumſpection, for fear of wounding the Inteſtines. The divided Integuments ſhould be alſo elevated by the Thumb and Finger of the left Hand; and to avoid the Inteſtine, a ſmall Opening may be made in the Peritonæum with the Point of the Scalpell, to introduce the Finger; and if the Surgeon ſhould meet with a Quantity of Water or Lymph, diſcharging itſelf by the

[a] A large *Clyſma fumoſum* of the common *Engliſh* or weak Tobacco, was injected into a poor Patient under this Diſorder, but with no Effect: But the Smoak of ſtrong *Virginia* Tobacco quickly gave the Patient a Stool, and the prolapſed Inteſtines ſoon returned into the Abdomen of themſelves.

[b] Some of our modern Surgeons rely greatly on the Exhibition of *Cort. Peruv.* in a Mortification of the Inteſtine. *Vide Commerc. litt. Norimb. Ann.* 1735. Pag. 3.

ſmall Aperture in that Membrane, he ſhould not be ſurprized, being no more than uſual, but ſhould proceed to divide that Integument upward with a Pair of Sciſſors, or the Scalpell (*Tab.* V. *Fig.* 3, 4, or 5) till he comes to the Rings of the Abdomen; and if any large Blood Veſſel ſhould be by Accident divided, which would obſcure the Work, it ſhould either be taken up with a Needle and Thread, or compreſſed by the Fingers of an Aſſiſtant, who ſhould alſo dry up the Blood with Lint or a Sponge. If the Inteſtine then appears to be ſound, it is to be returned by a gentle Preſſure through the Ring of the abdominal Muſcles; but if any Flatus or contained Feces prevents its return, they ſhould be firſt gradually preſſed out; and if that alſo proves inſufficient, the Ring of the abdominal Muſcles itſelf ſhould be divided, but inward or towards the Linea Alba, to avoid the epigaſtric Artery, which runs outward; and if the prolapſed Parts ſhould have any Adheſions, they ſhould be carefully ſeparated. The Ring of the abdominal Muſcles may be divided, either with a Scalpell, or, to avoid the Inteſtines, with the Director, *Tab.* XXIV. *Fig.* 8. or with the Inſtrument of Mr. MORAND, *Fig.* 9. or of LE DRAN, *Fig.* 10. and for the ſame Purpoſe, the concealed Scalpell, *Tab.* XXV. *Fig.* 1, 2. has been a long Time in Eſteem; but as this Inſtrument may injure the Inteſtine by its Point, which is elevated, the forementioned are uſually preferred to it; in uſing either of which the Inteſtines ſhould be preſſed down from the Inſtrument by an Aſſiſtant, which is the Uſe of the two Plates AA, in PETIT's Director, *Tab.* XXIV. *Fig.* 8. and of the Plate HI in LE DRAN's Inſtrument, *Fig.* 10. When the ruptured Part has been dilated, and the Inteſtine returned, the Wound is to be dreſſed with linen Compreſſes of a triangular Figure, and retained by the Bandage called *Spica*, though ſome ſcarify the Ring of the Abdomen, to make a firmer Cicatrix, and prevent a Return of the Diſorder.

Other Methods of Cure uſed by ARNEAU and PETIT.

III. Though the Patient may be happily remedied by the Means already propoſed, it may not be amiſs to acquaint our Reader with the Practice of two conſiderable Surgeons at *Paris* in the ſame Diſorder. ARNEAU having divided the Integuments with a Pair of Sciſſors, in the Director, *Tab.* I. MN, then dilates the Lips of the Wound with his Fingers, and gently ſeparates them from the ſubjacent Tumor, which Tumor he takes up between the Thumb and Fore-finger of his left Hand, and divides the Membranes, which cover the Sacculus of the Inteſtine, one after another, with a crooked Scalpell; and if any ſmall Veins occur, they are tied up in two Places, and then divided, that his Work may not be obſcured by their bleeding. Any part of the Integuments, which adheres to the Sacculus, he ſeparates with his Fingers, or with a Director, and Probe Sciſſors. This being rightly performed, he elevates the upper Part of the Sacculus by his Fore-finger and Thumb, and ſeparates it from all Adheſions, leaving it entire; but PETIT inſerts a Director, with an Inciſion Knife, under the Ring of the Abdomen, and makes an Opening in the Manner we have before deſcribed; after which, he returns the Inteſtine gently towards the *Os Ilium*; and to prevent a Return of the Diſorder, he applies a Bolſter or Pellet of compact Lint, dipt in the white of an Egg, ſhook together with Spirit of Wine, and being expreſſed, is convoluted in the Hand, before he applies it, in the Form of an Egg; over that he applies another, which is ſecured upon the Part by three or four triangular Compreſſes, each a little larger than the

the other, moiſtened with *Spt. Vini*, and firmly ſecured by the Bandage called *Spica Inguinalis*.

Our Opinion of this Method.

IV. But the preceding Method of Cure without opening the Sacculus, is not approved of by me nor many other eminent Surgeons; 1st, becauſe the Sacculus ſometimes adheres to the ſpermatic Veſſels, from whence it cannot be ſeparated without injuring them: 2dly, Becauſe the prolapſed Omentum or Inteſtine is frequently ſuppurated, which can be neither cured nor diſcovered while the Sacculus is entire: 3dly, Becauſe the Sacculus ſometimes contains a large Quantity of fetid and ichorous Matter, which would be this Way returned in the Abdomen, to the great Injury of the Patient: And CHESELDEN obſerves in his Anatomy, *Edit.* 3. *Pag.* 283. that he has found above two Pound of fetid Matter in the Sacculus of a Rupture of this Kind, which, according to the preceding Method, would have been doubtleſs returned into the Abdomen. 4thly, The Inteſtines or Omentum ſometimes adhere to the external Parts, from which they cannot be ſeparated without opening the Sacculus. 5thly, The Sacculus being left entire, may eaſily occaſion a Return of the Diſorder. 6thly, And laſtly, this Method cannot ſucceed in thoſe inguinal Ruptures, where the Peritonæum is lacerated. LE DRAN alſo diſapproves of this Method, becauſe he does not find it to be attended with any particular Advantages, and becauſe in incarcerated Ruptures of ſome Days continuance, the Inteſtine may be ſphacelated and ignorantly returned in that State, by which Means the Chyle and Feces would run into the Abdomen, and poſſibly kill the Patient: He therefore concludes, that the Sacculus ſhould be always opened when the Rupture is incarcerated.

CYPRIANUS's Method of Cure.

V. D. CYPRIANUS (who was formerly an eminent Phyſician and Surgeon in *Holland*, but ſpent the latter Part of his Life in *England*) uſed to open the Sacculus of the Peritonæum in this Diſorder, as we before adviſed, with this Difference, that inſtead of a Director he inſerted his Finger to guide and defend the Knife in dilating the Wound; and when the Ring of the abdominal Muſcles was not wide enough to return the Inteſtine, he inſerted a Director, and divided the Skin, Fat, Muſcles, and Peritonæum, to dilate the Ring; after which he has inſerted his Finger, and upon that a Pair of Probe Sciſſors, with which he divided them all, till there was an Opening made large enough to return the Inteſtine, without any Force; which he approved of, becauſe by preſſing the Inteſtine through a narrow Stricture, it frequently inflames and mortifies. If the Inteſtines adhered to any of the external Parts, he firſt carefully ſeparated them with the Scalpell, and cloſed the Wound by the *Sutura Nodoſa*, as in *Gaſtroraphia*, which Suture is recommended not only by CELSUS but alſo ROSSETUS, and above a hundred Years ago by ROLFINCIUS.

CHESELDEN's Method of Cure.

VI. CHESELDEN's Method for incarcerated Ruptures of the Inteſtines or Omentum, is to divide the Integuments, abdominal Muſcles, and Peritonæum, by a longitudinal Inciſion, ſufficiently large, and extended into the Aperture, through which they were prolapſed; and after introducing his Fingers into the Wound, draws in the Inteſtine, and if any Part of the Omentum adheres, he paſſes a Needle and double Thread round it, and after tying, amputates it, and thus he has happily reſtored the Patient. But whether he cloſes up the Wound by Suture, or any other Method, he does not inform us; though he has been ſo particular, as to repreſent the Caſe with a Figure.

What is to be done after reducing the Rupture.

VII. When the Inteſtine has been returned into the Abdomen, it is the Practice of ſome Surgeons to ſcarify, or make many ſmall Inciſions with the Scalpell or Sciſſors in the upper Part of the abdominal Ring, in order to render the Cicatrix more firm, and prevent a Relapſe of the Diſorder; but if this be put in Practice, it ſhould be done with great Caution, to avoid wounding the Inteſtine. The looſe Part of the Sacculus is then tied up with a Ligature near the Ring of the abdominal Muſcles, and afterwards cut off below the Ligature, together with ſo much of the Integuments as are ſuperfluous: The Wound is then to be dreſſed with Pledgits of Lint, and particularly the Pellet of PETIT before-mentioned, to be retained with thick triangular Compreſſes and the Bandage *Spica*; and bleeding the Patient after the Dreſſing, when of a full Habit, he may be inclined to reſt. During the whole Courſe of the Cure, the Patient ſhould lie ſtill, with his Head not much elevated, and his Diet ſhould be ſpare and eaſy of Digeſtion, as we have recommended in other Wounds. If the Patient ſhould not be looſe naturally, laxative Medicines may be uſed internally; an emollient Clyſter ſhould be injected daily; and if the Patient ſurvive the Space of four or five Days after the Operation, we may reaſonably ſuppoſe him to be out of Danger.

What is to be obſerved in the after Dreſſings.

VIII. After the firſt Dreſſing, the Parts ſhould not be undone without urgent Neceſſity before two or three Days, after which time the Wound may be cleanſed of its Sordes with warm Wine or Spirit of Wine, and the Remainder of the Cure performed, as we have directed in other Wounds: But Care ſhould be taken at every undreſſing to let an Aſſiſtant compreſs the upper Part of the Wound, to prevent a Relapſe of the Inteſtine; and when the Wound is healed, if the Patient be young, he ſhould wear a proper Truſs for a Year or two; but if an Adult, or old Perſon, the Truſs ſhould be wore during Life.

Concerning the Uſe of Tents after the Operation.

IX. Many of the moſt conſiderable Surgeons at *Paris*, and others, adviſe the Uſe of a large Tent, after the Operation and Reduction of the Inteſtine, which being made of Lint, of a conſiderable Length and Thickneſs, and faſtened to a Thread, is to be inſerted into the Abdomen, to keep open a Paſſage for the Vent of ſuch Humours, as are formed in the Cure. WIDENMANNUS and DIONIS direct the Tent to be made about the Length and Thickneſs of a Finger, and tell us, that it ought not to be extracted, till it falls off of itſelf by a Suppuration of the Parts; but PETIT condems the Uſe of them, as pernicious, by irritating the Parts, and admitting the external Air: Yet I cannot but acquieſce in the Uſe of them being proper, when there is a repeated Diſcharge of putrid Humours to be made from the Abdomen, as LE DRAN alſo thinks; otherwiſe it may be ſufficient, according to PETIT, to apply a thick Pellet, only, for the more ſpeedy Agglutination of the Wound.

What is to be done when the Inteſtine or Omentum is ſuppurated.

X. If the Omentum appears to be ſuppurated or enlarged, ſo that it cannot be rightly replaced in the Operation, a Needle and double Thread is to be paſſed round the ſound Part, and tied on each Side, and the viciated Part afterwards to be amputated; the ſound is to be returned, and the reſt of the Treatment to be made according to the Directions we have given in treating of Wounds of the Abdomen, with a Suppuration of the Omentum; but if the prolapſed Inteſtine itſelf be found mortified or ſuppurated, as ſometimes happens, when the Operation has been too long delayed, the Patient is then in the utmoſt Danger, but ſhould not be deſerted by the Surgeon, as being incapable

pable of any Aſſiſtance, he ſhould rather cut off the mortified from the ſound Part of the Inteſtine, and ſtitch the latter to the Margin of the Wound in the Abdomen, as we before adviſed in *Part* I. *Book* I. *Chap.* VII. by which Means many have been known to ſurvive the Diſorder and regain their former Health. We are encouraged to this Practice, not only by the Experience of ourſelves, and others, ſupported by the Teſtimonies mentioned in the Place now quoted; but we are alſo told by MERIUS, that a Man was happily cured, who had four or five Foot of his Inteſtine cut off, which was mortified in this kind of Rupture, and the ſound Part joined to the Lips of the Wound in the abdominal Muſcles. GARENGEOT alſo mentions a Man, whoſe Inteſtine being mortified and returned by the Surgeon, in that Condition, into the Abdomen, he had ſoon after a Diſcharge of his Excrement by the Wound, and a Month afterwards the Flux, by the Wound, not only leſſened, but the Lips of the Wound itſelf being ſtopped with a Pellet, and tied with a Thread, gradually healed, in ſuch a Manner, that by untying the ſame when there was Occaſion, the Man ſurvived, and had the natural Function of the Parts performed as uſual, with but little more Trouble.

XI. LE DRAN obſerves, that it is a common Calamity among poor People, who have had the Misfortune of an incarcerated Rupture, to miſtake it for an Abſceſs, and to treat it accordingly, without calling in the Aſſiſtance of any Phyſician or Surgeon. By which Means they bring the Part to Suppuration, after intolerable Pains; and upon its diſcharging Feces or Worms, which I have ſometimes obſerved, they then implore the Help of the Surgeon. Theſe, he ſays, generally require nothing more than the Ulcer, to be cleanſed daily, and treated with ſome vulnerary Medicine, covered with an Emplaſter of the ſame Kind; by which Means many ſuch Patients have been recovered, more by Nature than Art, the Wound healing up, only leaving an Aperture in the Groin, through which the Feces are diſcharged, and ſometimes Worms, as it were by a new Anus. In Imitation of Nature, therefore, LE DRAN (*Obſ.* 60.) does not return the ſuppurated Inteſtine into the Abdomen, nor does he amputate it, but only dilates the narrow Wound of the Abdomen, that the Blood, Sordes, and ſuppurated Parts of the Inteſtine may have a free Diſcharge, and thus he waits a ſpontaneous Agglutination of the Inteſtine with the Ring of the Abdomen; but if the Surgeon ſhould have injured the ſound Inteſtine in the Operation, he then thinks it neceſſary to ſtitch the Inteſtine to the Lips of Wound, which inflaming, will more intimately unite with each other.

LE DRAN's Method, when the Inteſtine is mortified.

XII. That the Parts will thus agglutinate or join together, is confirmed by a late Obſervation of RAMDOHRIUS, preſent Surgeon to his ſerene Highneſs the Duke of *Brunſwick*, who ſome Years ago cut off a large Part of a mortified Inteſtine in a Woman, that had an incarcerated Rupture, which broke of itſelf; and joining the two ſound Parts of the Inteſtine together, he inſerted one into the other, and tied them together looſely with a String, and replacing them in the Abdomen, drawed them by the String to the Mouth of the Wound, by which Means the divided Inteſtine inflamed, and ſurprizingly united; the Woman diſcharging her Feces afterwards, not through the Wound, but by the Anus, as before. The Woman afterwards lived in a State of Health, till in about a Year's Time ſhe died of a Pleuriſy, and upon opening her, the divided Inteſtines appeared to be united with each other, of which he

A remarkable Obſervation of RAMDOHRIUS.

he made a Preſent to me, together with part of the Abdomen, to which they adhered, and I now keep them in Spirits, to convince ſuch as are incredulous, and of a different Opinion.

What ſhould be done in the Oſchiocele incarcerata.

XIII. If the Inteſtine ſhould be prolapſed into the Scrotum, and ſo contorted or intercepted, that it cannot be reduced or returned into the Abdomen; the Surgeon will be then alſo obliged to make uſe of the Operation in the Manner we have before related, and as we ſhall hereafter more fully explain. The Reader may be furniſhed with more uſeful Obſervations upon this Subject, in SAVIARD, *Obſ. Chir.* 19. and 20. COURTIAL, *Obſ. Pag.* 150. alſo in LE DRAN, *Obſ. Chir.* and three other Diſſertations or Deſcriptions of Caſes in *Commerc. Litterar. Norimb. Ann.* 1735. *Pag.* 3. by WERLHOF, Phyſician to the King of *Great Britain*, which are very learned, and worthy of the Readers peruſal.

CHAP. CXVIII.

Of the Hernia femoralis, or crural RUPTURE.

Crural Ruptures deſcribed.

I. RElated in Appearance to the Hernia Inguinalis is the crural Rupture, obſerved, and ſo named by our modern Phyſicians; which is formed by a Prolapſion of the Inteſtine beneath the Integuments of the anterior or interior Part of the Thigh near the Groin, where the crural Artery and Vein paſs out of the Abdomen. Though this Diſorder is not unfrequently met with, eſpecially in the weaker Sex, it is a little ſurprizing, that it ſhould have been conſidered by ſo few, and with ſo little accuracy, inſomuch that many have made no Diſtinction between this and the Hernia Inguinalis. VERHEYEN ſeems to have been the firſt that has taken Notice of this kind of Rupture, though BARBETT ſeems to have hinted at it obſcurely before him. After VERHEYEN, the Diſorder was explained more at large by PALFYN, and after by GARENGEOT and Dr. FRIEND, COCHIUS and LE DRAN; indeed GARENGEOT tells us, that the Diſorder was known to the Ancients, and particularly PAULUS, but without mentioning the Place where; and for my own Part, I can find nothing upon the Subject in that Author, and the Words, which he attributes to BARBETT in the ſame Place, I cannot find in any part of that Author's Chapter upon Ruptures.

Nature of the Diſorder.

II. The Seat of this kind of Rupture is agreed on by Anatomiſts to be in a ſmall Cavity of the Thigh, between the iliacus and pſoas Muſcles under the Sartorius, where the crural Artery and Vein paſs from the Abdomen into the Thigh, in which part the Peritonæum may be eaſily diſtended, being very looſely guarded before by the Tendons of the abdominal Muſcles, and ſecured at Bottom by nothing but a little Fat, and the cellular Membrane, which may be more eaſily dilated than the Rings of the Abdomen, as it is ſubject to a perpendicular Preſſure in our erect Poſture. If we examine the *Os Ilium* in a Skeleton, we find a ſmall circular Excavation in its anterior Part above the *Acetabulum*, over which is extended the lower Part of the Tendon of the oblique deſcending Muſcle, like a String over the Arch of a Bow, which being intermixed with ſome tough ligamentary Fibres, forms what Anatomiſts call the *Ligamentum*

tum Veſalii or *Poupartii*; and this is the ſmall Arch or Cavity, through which the Inteſtines, and ſometimes the Omentum, are prolapſed in the crural Rupture. GARENGEOT ſays, this Rupture occurs more frequently than any other; but though I have ſeen and cured a great Number of all Kinds, I never met with above one or two of the crural Species.

Diagnoſis. III. Though there is a near Reſemblance between the inguinal and crural Rupture, yet if the Surgeon accurately obſerves the Parts occupied by each, he will, without much Difficulty, perceive their manifeſt Difference. For the inguinal Rupture is ſeated nearer the *Regio Pubis*, in that Part where the Proceſſes of the Peritonæum paſs through the Rings of the Abdomen, and accompany the ſpermatic Veſſels into the *Scrotum*; the Tumor extending itſelf from the Ring down to the *Scrotum*, whereas the crural Rupture is ſeated more to the Outſide of the *Inguen*, in the upper and anterior Part of the Thigh above the *Acetabulum*; the Crural is alſo uſually ſmaller, rounder, and deeper, than the Inguinal, which is more oval or oblong. Laſtly, as this Diſorder has not yet gained a Name in *Germany*, it may be not improperly ranked under the *Hernia Inguinalis*, which may be reckoned of two Kinds, *interior* and *exterior*, the latter being the crural Rupture.

Prognoſis and Cure. IV. The Conſequences and Treatment of the crural Rupture may be in a great Meaſure underſtood, from what we have before ſaid concerning the Hernia Inguinalis, though Patients afflicted with the crural Rupture are ſometimes in more Danger than in the other. It is to be alſo obſerved, that to reduce the prolapſed Inteſtine of the crural Rupture, it ſhould be preſſed more towards the *Linea Alba* inward, and not towards the *Os Ilium* outward, as in the *Hernia Inguinalis*. If the Inteſtine can be returned with the Hand in the crural Rupture, it may be ſufficient only to apply a Plaſter, Compreſs, and Bandage, as in the Hernia Inguinalis: But when the Inteſtine is incarcerated or intercepted, in ſuch a Manner, that it can receive no Benefit from the Uſe of Oils, Ointments, Cataplaſms, and Clyſters, eſpecially that of the Smoak of Tobacco; it will be neceſſary to proceed to the Operation, as we directed in the Bubonocele; *viz.* The Sacculus of the Peritonæum being laid bare, the Foramen, through which the Inteſtine prolapſed, ſhould be a little dilated, but ſo as not to injure the Sacculus. If the Diſorder be recent, as PETIT adviſes, then the Inteſtine or Omentum is to be gently protruded into the Abdomen, which may be uſually done without much Difficulty, as it is generally but a ſmall Part, or an *Appendicula* of the Inteſtine, that forms the Tumor, as VERHEYEN rightly obſerves in his Anatomy, *Cap.* DE PERITONÆO. When the Rupture is reduced, the Wound made in the Operation is to be healed like that in the Bubonocele. But if a large Part of the Inteſtine falls down, and adheres to ſome of the adjacent Parts, ſo that it cannot be returned without dividing the Sacculus, or when the Inteſtine may be reaſonably ſuppoſed to be ſuppurated from a long Neglect of the Diſorder, the Sacculus of the Peritonæum ſhould then be carefully inciſed, the Inteſtine freed and returned when ſound, as we directed in the preceding Chapter; but great Caution ſhould be uſed not to injure the ſubjacent crural Artery or Vein, which might inſtantly endanger the Patient's Life. And laſtly, if the Omentum is prolapſed in this Rupture, and it or the Inteſtine viciated, the unſound Parts may be amputated, and the reſt treated as in the preceding Chapter.

CHAP.

CHAP. CXIX.

Of the Oſcheocele, or Hernia of the Scrotum, and particularly of the ENTEROCELE, *or Prolapſus of the Inteſtine into the Scrotum.*

Deſcription and Kinds of the Oſcheocele.

I. WE have hitherto deſcribed thoſe Ruptures, which happen in the ſuperior Part of the Abdomen; we now proceed to thoſe, which ariſe from the ſame Cauſes in the Scrotum. A Rupture in this Part is generally termed by Phyſicians and Surgeons an Oſcheocele, or Hernia Scrotalis; of which there are two Kinds; true, from a Prolapſion of the Inteſtine or Omentum; and ſpurious, or only apparent, from a Tumor of the Teſticles or ſpermatic Veſſels, or a Diſtention with Air, Water, or ſome offending Humour. The Oſcheocele is therefore diſtinguiſhed into various Kinds, according to the different Subſtance, with which the Scrotum is diſtended, by which it is alſo differently denominated: When the Inteſtine is prolapſed, through the Proceſs of the Peritonæum into the Scrotum, the Tumor is then called Enterocele; if from the Omentum, Epiplocele; if from a Diſtention with Water, Hydrocele; from Wind or Flatus, Pneumatocele; when from Blood, Hæmatocele: If the Teſticle is enlarged beyond its proper Dimenſions, it is termed Sarcocele; and when the ſpermatic Veins are too much diſtended, it is termed Varicocele, Circocele, or Hernia Varicoſa: And when an Abſceſs is formed in the Scrotum, it is by ſome termed *Hernia Humoralis*. Sometimes two or more of theſe Subſtances concur together to form the Tumor, which is then named conjunctly from them, Entero-epiplocele, or Hydro-enterocele, *&c.* Sometimes a Hydrocele is in one Side of the Scrotum, while an Enterocele occupies the other, as I lately obſerved; and ſo of the reſt.

Of the ENTEROCELE.

Enterocele deſcribed.

II. An Enterocele is defined by Phyſicians, to be a Tumor formed by a Prolapſion of the Inteſtines through the Rings of the Abdomen and Proceſſes of the Peritonæum into the Scrotum: See *Tab.* XXV. *Fig.* 3. AB. It is ſometimes termed an *Oſcheocele*, and compleat Hernia, in Contradiſtinction to the *Bubonocele*, which is an imperfect Hernia, the Inteſtine not extending into the Scrotum. The Diſorder always ariſes from a violent Diſtention of the Peritonæum and Rings of the abdominal Muſcles, through which the Inteſtine prolapſes into the Scrotum (ſee *Tab.* XXV. *Fig.* 4. D) the Peritonæum being dilated into a Sacculus, including the Inteſtine oftner than ruptured, ſo as to let the Inteſtine thro' into the Scrotum; but the Peritonæum is ſometimes ruptured, as ÆGINATA obſerves, *Lib.* VI. *Cap.* 65. this Rupture is always attended with Pains, and uſually happens but of one Side, never in both at a Time; ſometimes only the Inteſtine falls down, at other Times it is accompanied with the Omentum.

Cauſes and Signs of the Enterocele.

III. This kind of Rupture, like the Exomphalos and Bubonocele, uſually proceeds from ſome Violence, by a Fall, Blow, or ſtraining to Leap, lift great Weights, Vomiting, *&c.* and according to the Nature of the Cauſe the Rupture is formed, either inſtantly, or imperceptibly by Degrees: The Tumor appears ſoft to the Touch, like an Inteſtine or Bladder diſtended with Wind; the Tumor

Tumor firſt appears ſmall in the Inguen, and gradually deſcends down to the Teſticle of the ſame Side in the Scrotum, which is thereby ſometimes diſtended half way down the Thigh, or even down to the Knee. The other Symptoms of this Rupture are the ſame with thoſe of the Bubonocele before deſcribed: A ſoft Tumor appears extended from the Ring of the abdominal Muſcles down to the Scrotum, near the Teſticle, from which it may generally be diſtinguiſhed by the Touch. When the Diſorder is but ſlight and without Inflammation, it is ſometimes diminiſhed or augmented at Intervals, eſpecially when the Patient lies down, the Inteſtine returning into the Abdomen of itſelf, or with a gentle Preſſure of the Hand, making a Sort of murmuring Noiſe; but upon the Patient's ariſing, or removing the Hand, it again returns with the like Noiſe. The Tumor is alſo increaſed by crying, plentiful eating, and lifting or carrying Burdens, being contracted with Cold and dilated with Heat. Sometimes the prolapſed Inteſtine is inflamed, greatly diſtended with Feces, or adheres to the adjacent Parts, by which Means it is rendered incapable of returning into the Abdomen. The Enterocele may generally be diſtinguiſhed from the Hydrocele or Pneumatocele, by its returning into the Abdomen with a murmuring Noiſe; the Patient is ſometimes troubled with cholicky Pains, more or leſs violent in the Abdomen, Inguen, and Scrotum, with a Nauſea and Vomiting, eſpecially in the *Oſcheocele incarcerata.*

IV. This kind of Rupture may be ſuſtained with but little Inconvenience, by Men not much addicted to hard Labour, and Women with Child; but it ſhould never be left to itſelf, without a Support or Truſs, leſt by ſome Accident the Inteſtines ſhould become incarcerated, and incapable of being returned. When the Diſorder is recent, and in a young Subject, it may be perfectly cured without Danger of a Relapſe; as it may alſo in Adults, and old People, by conſtantly wearing a proper Truſs. It is to be alſo obſerved, that there is leſs Danger in thoſe Ruptures, where the Inteſtine is accompanied with the Omentum, than in ſuch as have a Prolapſion of the Inteſtine without the Omentum. Prognoſis.

V. When the Rupture is not yet become incarcerated, but the Inteſtine is returnable without any Adheſions, the Surgeon ſhould immediately proceed to reduce the Parts, and retain them in their proper Situation, and to cloſe up the Aperture firmly with a Truſs, Bandage, or by Inciſion, termed Celotomia. The main of the Cure therefore, in a recent Enterocele, depends upon the Application of a proper Bandage, as we have deſcribed in the Bubonocele (*Chap.* CXVI. *N°* 6. *Tab.* XXV.) which, with the Aſſiſtance of proper Internals, Externals, and Diet, ſeldom fails to ſucceed in Adults, as well as in Infants and Children [a]. Method of Cure in the Enterocele.

VI. I cannot help condemning in this Place the baſe and common Practice of ſome Medicaſters, who having tied up the ſpermatic Veſſels and Proceſs of the Peritonæum, caſtrate the Patient in this Diſorder without any Manner of Of Caſtration in the Enterocele.

[a] About the End of the laſt Century, there was one PRIOR DE CABRIER in *France*, who boaſted himſelf poſſeſſed of a ſecret Medicine, by which all Ruptures were curable, without the Operation, or any Truſſes. This Arcanum was purchaſed of him by the *French* King *Lewis* XIV. at a high Rate, who afterwards made it public for the common Good; when it appeared to be nothing but *Sp. Salis*, to be taken in a certain Quantity, every Day, in Red Wine, for a conſiderable Time; but to no Purpoſe, without a Truſs. *Vide* VERDUC on Bandages, and DIONIS, *Surg. Chap.* on Ruptures.

Neceſſity, and thereby torture the Patient, and endanger his Life. Such pernicious Practices ought to be corrected with Severity by the Civil Magiſtrate, eſpecially as it is not a Preſervative againſt a Relapſe of the Diſorder, which is confirmed not only by my own Experience, but alſo the Authority of CELSUS and CYPRIANUS. This kind of Rupture ſhould therefore be reduced, and the Parts ſecured with a Truſs, without tormenting the Patient with Inciſion or Caſtration. More may be ſeen upon this Subject in our Diſſertation, upon removing the Abuſe of Celotomia, *Helmſtadt*, *Ann.* 1728.

Truſſes proper for the Enterocele.

VII. The beſt Truſſes for this Diſorder are thoſe, which compreſs the Part, ſo as to prevent a Relapſe of the Inteſtines: Of thoſe there are a great Variety, contrived in various Shapes, for a Rupture, not only on one Side, but on both; the beſt of which are exhibited in *Tab.* XXV. *Fig.* 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15. They may be made of various Materials, but the ſmaller, for Infants, ſhould be compoſed of ſoft Leather, or lined with Callico, ſtuffed with Cotton; but the ſtronger and larger Truſſes may be compoſed of ſteel or ſtrong Leather. Theſe are to be applied ſo, as to compreſs the Orifice of the Rupture, which will probably unite ſoon after, and prevent a Relapſe of the Diſorder; but the Patient ſhould not leave them off, for at leaſt the Space of half a Year; during which time, and ever after, he ſhould uſe a ſpare Diet, and avoid Strainings of all Kinds, violent Exerciſe, Riding, Vomits, and conſtantly uſe laxative Medicines, as there may be occaſion, leſt by a too violent Preſſure of the abdominal Muſcles the Inteſtines ſhould be again forced down. By this Means the Rupture may be cured, even in thoſe who are above thirty (if the Diſorder be recent, and the Surgeon's Aſſiſtance timely called in) without any Uſe of the Knife, which would be here more pernicious than ſerviceable.

Celotomy deſcribed.

VIII. Another Method of reducing the Enterocele is by Celotomy, or Inciſion before mentioned, which is often practiſed by Mountebanks, who generally deprive the Patient of his Teſticle in the Operation, but is condemned by all prudent Surgeons, upon many Accounts, eſpecially as it deprives them of a moſt neceſſary Organ, by a dangerous and excruciating Operation, without any Advantage: Not but that it is neceſſary to make an Inciſion through the Integuments, to return the Inteſtine, when it cannot be reduced by any other Means.

The Method of performing Celotomy, uſed by Mountebanks.

IX. The Patient is firſt laid upon a Table, with his Head inclined backward, his Hips elevated, and all his Limbs and Head ſecured from moving, by faſtening them with Ligatures to the Table, or by holding with the Hands of Aſſiſtants: The Operator then protrudes the Inteſtine into the Abdomen, after which an Aſſiſtant compreſſes the ruptured Part, or dilated Ring, with his Hand; the anterior Part of the Scrotum of the affected Side is then elevated, and opened by a longitudinal Inciſion; the Sides of the Wound are then dilated, ſo as to diſcover the Proceſs of the Peritonæum, which is then ſeparated, together with the Teſticle, from the adjacent Parts by the Fingers, and taken out of the Scrotum, to the great Torment of the Patient; the diſtended Part of the Proceſs of the Peritonæum is then drawn down, and firmly tied together with the ſpermatic Veſſels by a ſilk Ligature; but others divide the ſpermatic Veſſels firſt, and then ſeparate the Scrotum from the Teſticle, which they conceal in one Hand from the Eyes of the Aſſiſtants; the Part is then dreſſed with Lint, Plaſter, Compreſs, and Bandage, and dreſſed the following

Days

Days with *Ol. Ovar. Hyperici*, or ſome other vulnerary Balſam, till the Ligature, which tied the Proceſs of the Peritonæum, and ſpermatic Veſſels, is digeſted off, which uſually happens ſix or ſeven Days after the Operation, the reſt of the Cure being perfected, as in other Wounds: And thus the Patient either recovers, or dies of a Fever and Convulſions, from the Severity of the Operation; though there is a more ſevere Method extant in the Writings of FABRICIUS AB AQUAPENDENTE and SCULTETUS, practiſed in *Italy*, by which the Proceſs of the Peritonæum is firſt tied, by paſſing a Needle and ſtrong wax'd Thread round it; after which they cut off the Teſticle, and apply an actual Cautery to the ſpermatic Veſſels.

Method of Cure with gold Wire.

X. Another Method accurately deſcribed by PAREY and GEIGER, conſiſts chiefly in paſſing a ſmall gold Wire round the upper Part of the Proceſs of the Peritonæum near the Ring of the abdominal Muſcles, leaving the Teſticle in its natural Poſition; the gold Wire is twiſted by a Pair of Forceps, ſo as to confine the Proceſs of the Peritonæum, without compreſſing the ſpermatic Veſſels, in order to prevent the Inteſtine from falling through it again; but this Operation ſeems to me uſeleſs, and incapable of ſucceeding; for if the Wire is not drawn cloſe, the Inteſtine will eaſily protrude it down, and dilate the Proceſs as before; but if it be drawn cloſe, the ſpermatic Veſſels will be compreſſed, and conſequently the Teſticle will mortify; nor is it poſſible to conceive how the Wound can heal, but will rather be a continual Ulcer, from the conſtant Irritation of the Wire in the Wound; upon which Account it has been deſervedly treated with Neglect by all prudent Surgeons.

LITTLE JOHN's Method.

XI. I had lately an Account ſent me from *England* by Mr. JOHN DOUGLAS, of a Phyſician, there named LITTLE, whoſe Operation in this Diſorder differed from others, in applying Oil of Vitriol, or other ſtrong Cauſtics. After the Rupture is reduced, he applies the Cauſtic above the *Os Pubis*, in ſuch a Quantity, as may quickly eat through the Skin, for the larger Eſchar it made, the more effectual and uſeful it would prove; for which Reaſon, the Application was repeated for two or three Days, that it might the more effectually corrode the Skin, removing the old Eſchar, every Time, before the Application of the Oil of Vitriol, that it might the more effectually penetrate: The Eſchar was then dreſſed with a Plaſter of *Oxycroc. & Paracelſ.* mixed in equal Parts, and ſpread upon Leather, retained with Compreſſes and Bandage, the Uſe of which Plaſter was to ſeparate the Eſchar, in order to cure the Ulcer. If any luxuriant or ſpongy Fleſh appeared, he directed it to be taken down with *Lap. Infernalis*, keeping the Patient to a ſpare Diet, without the leaſt Exerciſe, till the Wound was cured; after which, *Empl. ad Herniam* was applied to the Cicatrix, and ſecured by a proper Bandage, which the Patient continued to wear, till the Reſiſtance of the Cicatrix was ſufficient to prevent a Relapſe of the Diſorder. He had five thouſand Pounds given him for the Diſcovery of this Method by King *George* I. notwithſtanding which, it quickly became contemptible, and in diſuſe among moſt of the *Engliſh* Surgeons. See HOUSTON's Hiſtory of Ruptures, and DOUGLAS's Syllabus of chirurgical Operations.

Another Method by SERMECIUS.

XII. SERMECIUS, in his Treatiſe of Lithotomy, mentions another Method of curing Ruptures, which he learnt among the *Ruſſians*: In which a longitudinal Inciſion was firſt made in the Inguen; and the Proceſs of the Peritonæum, containing the Inteſtine, was then freed from the Parts; after returning the Inteſ-

tine, and being drawn ſtrongly out of the Wound, it was tied with a ſtrong Thread, as near as poſſible to the abdominal Muſcles (ſee *Tab.* XXV. *Fig.* 4. BB.) The Ligature was then left hanging out of the Wound, which was dreſſed in the uſual Manner, till it digeſted off of itſelf; by which Method, he aſſures us, many have been cured, without Injury to the Teſticle or ſpermatic Veſſels. This Method is by SERMECIUS recommended, as of the greateſt Uſe in Adults, where the Inteſtine cannot be retained in the Abdomen by Bandage.

Another Method by ſcarifying the Ring of the Abdomen.

XIII. In order to preſerve the Teſticle, ſome Surgeons do not tie the Proceſs of the Peritonæum and ſpermatic Veſſels with a Ligature, but having returned the Inteſtines and Omentum, they then ſcarify the Ring of the Abdomen or Aperture, through which the Inteſtine prolapſed, together with the Skin, in order to render the Cicatrix more firm; by which Means, many have been cured of theſe Ruptures, eſpecially if they continue to wear a proper Bandage for a conſiderable Time afterwards; but I think the Operation may ſucceed better in Infants than in Adults.

What is to be done when the Inteſtines are not returnable by adhering.

XIV. If in the Enterocele the Inteſtine cannot be reduced, eſpecially if it adhere to the Proceſs of the Peritonæum, Ring of the abdominal Muſcles, Scrotum, or Teſticle, the Patient being afflicted with the iliac Paſſion, and other Symptoms in that Caſe; no Truſs or Bandage will be of any Service, but rather increaſe the Inflammation, Pain, and other bad Symptoms: There is then but one Method of ſaving the Patient, by a ſevere Operation, in order to which the Patient is to be placed, and the Integuments divided, as we before directed, in *N°* 8. and in *Chap.* CXVI. *N°* 2. *& ſeq.* and when the Sacculus appears, it is to be carefully ſeparated, and a ſmall Aperture made in it big enough to introduce a Quill, or ſome ſuch other Inſtrument, to ſeparate the Inteſtine from all its Adheſions, before it is protruded into the Abdomen, which ſhould be always done in the Enterocele incarcerata, when the Inteſtine adheres; after which, the Wound is to be healed, and the Patient ſecured from a Relapſe, by continual wearing the Bandage *Spica*.

Method of treating the Enterocele incarcerata.

XV. If the Stricture of the Inteſtine is ſo great, as to render all Means ineffectual to reduce the Rupture, eſpecially Bleeding, Cataplaſms, Clyſters, and particularly the Clyſma Fumoſum of Tobacco, the Surgeon muſt then have Recourſe to the Knife, to ſave the Patient, as we before propoſed in the Bubonocele incarcerata, *Chap.* CXVI. The better to illuſtrate and explain this difficult Operation to our Reader, we have ſupplied him with Figures, *Tab.* XXVI. *Fig.* 1, 2, 3. from the Treatiſe of incarcerated Ruptures of the Scrotum of MATICHART, before recommended by us; which we ſhall conſider more at large in the Explanation, and at preſent conclude with the following neceſſary Obſervations.

Neceſſary Obſervations in the Enterocele.

XVI. 1st, When the Rupture is not attended with bad Symptoms, but is reducible, without any Diviſion of the Sacculus; in that Caſe, the Integuments are to be divided, in ſuch a Manner, that the Sacculus may be diſtinctly viewed; after which, the prolapſed Inteſtine may be returned into the Abdomen, without much difficulty, and the Remainder of the Cure performed, as we have directed in the Bubonocele, *Chap.* CXVI. *N°*. 2. But 2dly, when the Rupture is of a worſe Kind, or when the Omentum or Inteſtine adheres, and a large Quantity of ſome Humour contained in the Sacculus; then the preceding Method is not ſo convenient, but the Sacculus ſhould be divided, and the

Inteſtine carefully returned; but if its Return ſhould be obſtructed by a Stricture at the Ring of the abdominal Muſcles, that Stricture ſhould be firſt dilated by Inciſion, and after freeing the Inteſtine or Omentum from all its Adheſions, they may be returned as before. But the Inteſtine ſhould be treated ſo tenderly, as rather to divide the Part, to which it adheres, even if it be the Teſticle itſelf[a], than injure its own proper Coats. In the next Place, the Sacculus of the Peritonæum is to be freed from all its Parts, and ſecured by a Ligature, tied round near the Ring of the abdominal Muſcles, made of a flaxen Thread waxed, and three or four Times doubled; after which, that part of the Sacculus below the Ligature is to be extirpated, and the Wound dreſſed as before; after the Ligature is digeſted off, it forms a Sort of Tubercle or hard Cicatrix, which being joined by Scarification to the Lips of the Wound, firmly reſiſts the Preſſure of the Inteſtine, and prevents it from ſubſiding into the Scrotum; but in the mean Time, the Surgeon ſhould be careful not to paſs the Ligature round the ſpermatic Veſſels. If, 3dly, one of the epigaſtric Arteries ſhould be divided in the Operation, it ſhould be immediately taken up with a Needle and Thread, or compreſſed by an Aſſiſtant, till the Operation is over. But, 4thly, if the prolapſed Inteſtine is diſtended with Wind or Feces, ſo that it cannot be returned, its Contents ſhould then be gradually protruded into the Abdomen, by which Means the flaccid Inteſtine will more eaſily return; but I ſhould rather approve of dilating the Stricture by Inciſion, when neceſſary, than endanger a Contuſion, by forcing it through an Aperture too ſtrict, proceeding afterwards, as we have directed in the Bubonocele incarcerata, *Chap.* CXVI. 5thly, If the Meſentery ſhould alſo accompany the Inteſtine in the Rupture, it ſhould, according to the Obſervation of PETIT, be returned firſt; but if the Omentum accompanies it, then the Inteſtine ſhould be returned firſt, and the Omentum laſt. 6thly, If the Inteſtine ſhould happen to be wounded in dividing the Sacculus, it ſhould be joined together by Suture, and faſtened by the Thread to the Wound of the Abdomen, and afterwards treated according to our Directions in Wounds of the Inteſtines. 7thly, If the Inteſtine ſhould be ſphacelated or mortified, the dead Part is to be cut off, and the Sound ſtitched to the Margin of the Wound. 8thly, If Part of the Bladder ſhould come through the Ring of the abdominal Muſcles, as it ſometimes does in gravid Women, that ſhould be firſt returned before the Inteſtine. 9thly, The ſuperfluous Parts of the Integuments in the Scrotum may be cut off, to render the Cicatrix ſtronger and more uniform. Laſtly and 10thly, the Scrotum and Parts affected are to be defended with Compreſſes, and ſecured by the Bandage Spica, or ſome other, for the ſame Purpoſe.

[a] Some are for extirpating the Teſticle, when it adheres to the Inteſtine; but I rather approve of cutting off a ſmall Portion only, as a Wound of the Teſticle will heal. GARENGEOT ſays, he has found the prolapſed Inteſtine and the Teſticle confuſed together in one Sacculus; which muſt be very rare, being hardly ever obſerved by others, becauſe the Teſticle is included in a Sacculus of its own.

CHAP.

CHAP. CXX.

Of the EPIPLOCELE, *or Prolapſus of the Omentum into the Scrotum.*

Epiplocele deſcribed.

I. AN *Epiplocele* is here, that Species of Rupture, in which the Omentum ſubſides into the Scrotum. This Rupture is not ſo eaſily diſcoverable as the Enterocele; but it always ſhews itſelf by a ſoft Inequality or Tumor, which increaſes a little upon ſtraining or contracting the abdominal Muſcles: And upon preſſing it with the Fingers there is no murmuring Noiſe made, as in the Enterocele; and the Reſiſtance of it is alſo different. Sometimes the Omentum may be returned into the Abdomen without difficulty, in this Rupture; and ſometimes it adheres ſo ſtrictly to the adjacent Parts, or is ſo much enlarged, that a Reduction of the Tumor can be by no Means effected: Both which I obſerved in opening a male Subject after Death [a]. Though there are ſome who deny, or at leaſt queſtion, the Exiſtence of theſe Ruptures; for which they may have ſome Reaſon, as the Diſeaſe ſeldom occurs, according to the Obſervation of VESALIUS [b]. Nor is the *Epiplocele* ever ſo large or dangerous as the *Enterocele*; being for the Generality attended with no bad Symptoms, and often tolerable, during the Life of the Patient, without any Aſſiſtance from the Surgeon. The Reaſon why this Rupture ſo ſeldom happens, is, from the ſhortneſs of the Omentum in moſt Subjects, which Anatomy aſſures us is but ſeldom long enough to reach (and conſequently cannot ſubſide into) the Proceſſes of the Peritonæum. Sometimes a Tumor or Enlargement of the *Membrana Adipoſa* in the lower Part of the Abdomen has been miſtaken by Phyſicians and Surgeons for an *Epiplocele*, or an *Enterocele*; and at other Times the true *Epiplocele* has been attended with the ſame Signs and malignant Symptoms as the *Enterocele incarcerata*, ſo as to make the Operation abſolutely neceſſary; in which nothing appeared to the Surgeon but the prolapſed Omentum, as we read in the chirurgical Writings of RUYSCH, DIONIS, and GARENGEOT, on this Diſorder.

Cure of the Epiplocele.

II. The Cure of an *Epiplocele* conſiſts principally in a Reduction of the Tumor, by returning the Omentum again into the Abdomen; and in ſecuring the Parts from a Relapſe, by a Truſs or Bandage, as in the *Hernia Inguinalis* and *Scrotalis*. If the Omentum cannot be returned into the Abdomen, and the Patient notwithſtanding has little or no Uneaſineſs; it ſeems better to leave the Diſorder to itſelf, than cure it by the Operation, which is a Remedy worſe than the Diſeaſe: But when the prolapſed Omentum is much enlarged, inflamed, or attended with great Pain, Fever, and Vomiting, as is uſual in the *Enterocele incarcerata*; the Surgeon ſhould then haſten to the Operation without further delay, as we have directed in the *Hernia Inguinalis* and *Scrotalis incarcerata*. Care ſhould be taken in the Operation not to return any part of the Omentum, which is corrupted; but after tying it with a Ligature, let it be cut off from the Sound, as we before adviſed in Wounds of the Abdomen [c]:

[a] This Caſe is deſcribed by me in *Ephem. Nat. Cur. Cent.* V. *Obſ.* 85. *Pag.* 164.

[b] *De Corporis Humani Fabrica, Lib.* V. *Cap.* 4.

[c] GARENGEOT, though he rejects paſſing a Ligature above the unſound Part of the Omentum in Wounds of the Abdomen, yet approves of it in the Operation for Ruptures, *Pag.* 337. *Edit.* II.

Or

Or if the Surgeon pleaſes, he may wait a ſpontaneous Separation or caſting off the mortified from the ſound Parts, without a Ligature. It may be worth the Reader's while to peruſe the Obſervations of LE DRAN on this Diſorder, II. *Obſ.* 63. *& ſeq.*

III. Sometimes the Inteſtine falls down together with the Omentum, which denominates the Rupture an *Entero-epiplocele*; but is hardly diſtinguiſhable from the ſimple Enterocele: Nor does it much ſignify whether it be diſtinguiſhed or not; ſince the Symptoms and Method of Cure are the ſame in both. But if part of the Tumor ſubſides, or returns into the Abdomen, and leaves a ſoft reſiſting Subſtance behind; it is probable, that the Omentum accompanies the Inteſtine: And then the Caſe is uſually not ſo dangerous, as when the Inteſtine prolapſes alone; becauſe the ſoft and fat Subſtance of the Omentum prevents the Rings of the abdominal Muſcles from making ſo intenſe a Stricture on the Inteſtine. The Cure conſiſts chiefly in returning the Inteſtine and Omentum into the Abdomen, with or without the Operation, healing the Wound, and ſecuring the Parts as we have before directed in the *Enterocele*. Method of treating the Entero-epiplocele.

CHAP. CXXI.

Of ſpurious Ruptures, and firſt of the SARCOCELE, *and* CASTRATION.

I. SPurious Ruptures are thoſe Tumors formed in the Scrotum, not from a Prolapſion of the Inteſtines or Omentum out of the Abdomen, but a Collection of Humours, a Scirrhoſity of the Teſticle, or a Dilatation of its ſpermatic Veſſels: And a *Sarcocele* in particular is, when the Teſticle is conſiderably tumified and indurated, like a Scirrhus, or much enlarged by a fleſhy Excreſcence, which is frequently attended with acute Pains, and ſometimes Ulceration, ſo as to degenerate at laſt into a true cancerous Diſpoſition; which has ſeveral Times happened within my own Obſervation. Both theſe Kinds of the Sarcocele are very different from an Inflammation of the Teſticle, as they advance but ſlowly, and are, in their firſt Stage, attended with little or no Pain; whereas a *Phlegmon* of the Teſticle begins with intenſe Heat and Pain, and quickly terminates as in other Inflammations. Nor does the Sarcocele proceed uſually from one and the ſame Cauſe: But when the Tumor of the Teſticle is accompanied with hardneſs, the Cauſes are much the ſame with thoſe beforementioned, in a Scirrhus (*Part* I. *Book* IV. *Chap.* XVII.) When the Teſticle is enlarged by a kind of fleſhy Excreſcence, then the Cauſe of the Diſorder is uſually ſome Contuſion, or other external Violence: Though I remember a Patient, who had a Sarcocele of this kind, and could not recollect that he had received any ſuch external Injury. The Sarcocele differs as to its *magnitude*, being frequently no larger than a Hen's Egg: Though I have cured ſome Patients, in which the Teſticle has been bigger than one's Fiſt; and ſome of them I now keep by me in Spirits. The *Signs*, by which a Sarcocele may be diſtinguiſhed from other Ruptures, are principally the Hardneſs of the Tumor, and its Seat being in the Teſticle; whereas the true Herniæ are diſtinct from the Teſticle, and ſofter to the Touch. If a Sarcocele be not timely brought to Suppuration, it very eaſily degenerates into a Cancer; as we are aſſured by daily Sarcocele deſcribed.

daily Experience, or at leaſt becomes exceeding troubleſome by its Bulk and Pain; and if both Teſticles are affected, it frequently renders the Patient impotent. If the Tumor proceeds through the Inguen up to the Abdomen, even Caſtration will be uſeleſs, and Death the Conſequence, becauſe the Diſorder is communicated from without internally; and therefore it will be more adviſeable for the Surgeon to deſiſt from the Operation.

Cure by Medicines.

II. A recent Sarcocele may frequently be ſuppurated by digeſtive Medicines, as well internal as external. MATTHIOLUS, AQUAPENDENS, and SCULTETUS, tell us, *Rad. Ononidis* ʒ i. given to the Patient every Day *in Hauſt. vin. Abſynthit.* is of great Efficacy; and externally the following Plaſter is to be applied:

℞ *Gumm. Galban. Ammoniac. Bdell. aa* ʒ *ſs. diſſolut. in aceto adde Adip. anat. liq. & colat.* ʒ i. *ſs. Cer. citrin.* ʒ ii. *Ol. Lilior. alb. Medall. crur. bov. aa* ʒ *x. M. F. Emplaſtrum.*

This is to be ſpread on Linen, and renewed on the Part every third Day. DIONIS, treating of this Diſorder in his Surgery, propoſes a Mixture, *Ex Emplaſt. Diabotono, Divino, & Vigonis aa*, which he tells us he has ſometimes applied with Succeſs. Some prefer the *Emplaſt. Noriburg.* as a good Digeſtive in this Caſe, uſed either ſeparately, or mixed with the preceding: Others again extol the Vapours or Acid Fomentation, which we propoſed in the Cure of a Scirrhous beforegoing. For internal Medicines, the Decoction of the Woods, with Mercurials, have, in my own Experience, been found of the greateſt Efficacy; eſpecially if the Patient takes a Sudorific every Morning, with a proper Regimen, and a mercurial Purge every third or fourth Day.

Cure by Caſtration.

III. When other Medicines prove ineffectual, the Size and Pain of the Tumor increaſe, and it ſeems inclined towards a cancerous Diſpoſition; if it has not yet reached the Ring of the abdominal Muſcles, there is then but one Means left of relieving the Patient by a painful Operation, from an otherwiſe incurable [a] and fatal Diſorder: And that is a dextrous and timely Extirpation of the diſordered Teſticle, or both, if they are affected, by the Scalpell; which is termed Caſtration, and renders the Patient impotent, when he is this way deprived of both Teſticles.

Method of caſtrating.

IV. The Operation for Caſtration is performed much in the ſame Manner as Celotomy, *Chap.* XIX. *N°* 6. but it ſhould be done with more Circumſpection and Tenderneſs. The ſpermatic Veſſels ſhould be firſt tied ſecurely with a Ligature near the Inguen or Abdomen, and afterwards divided, to give the Patient leſs Pain: And the Wound may then be treated, as we have directed in the Cure of Ruptures. As a Diviſion of the ſpermatic Veſſels, which are ſo much enlarged, may be attended with a fatal Hæmorrhage, the moſt prudent Surgeons do for the greater Security paſs a double Ligature round thoſe Veſſels, one below the other; or elſe they do not immediately extirpate the Teſticle, as ſoon as it has been freed from the Scrotum, and its Veſſels ſtrictly tied; but they return it, and wait a few Days, till the Teſticle begins to grow flaccid, and mortifies; which is a Sign the ſpermatic Veſſels are well ſecured,

[a] That the Diſorder is frequently incurable by any Means, is confirmed, as well by the Obſervation of myſelf as others; and particularly WEPFER, *de Cicut. Aquat. Pag.* 101. mentions a cancerous Sarcocele, that weighed above two Pounds.

and

and may be then divided without any Danger: But if that does not follow, the Ligature is not ſtrict enough; and therefore another muſt be made much tighter. LE DRAN rightly adviſes a Needle and double Thread to be paſſed through the Spermatics, and ſo to tie them in two Halves; as a more certain Method of preventing a future Hæmorrhage. AQUAPENDENS, SCULTETUS, and others, apply an actual Cautery to the divided ſpermatic Veſſels; which ſevere Practice is, in my Opinion, deſervedly rejected by the Moderns for the Ligature. Caſtration is therefore abſolutely neceſſary for removing a cancerous Sarcocele, which is otherwiſe incurable: Nor is the Objection to it great, becauſe one ſound Teſticle is ſufficient for Procreation. I am not ignorant, that ſome adviſe a Separation of the Nerve from the ſpermatic Veſſels, before the Ligature be made, to prevent Convulſions, as they ſay, from the Stricture on it; but that is both unneceſſary and impracticable: Unneceſſary, becauſe a Convulſion hardly ever follows the Stricture of the Ligature on ſo ſmall a Nerve; and impracticable, becauſe the Nerve is ſurprizingly ramified, and interwove with the ſpermatic Veſſels, as we are aſſured by Anatomy, of which they muſt certainly be ignorant, who adviſe ſuch a Practice. However, it may not be amiſs to paſs a Compreſs of Lint under the Ligature, about an Inch below which the Veſſels ſhould be divided.

V. If a Patient ſhould be troubled with a fleſhy Excreſcence upon his Teſticle, which is in other Reſpects ſound, and finds no Relief from Medicines; the Teſticle may be preſerved, and the Patient freed from his Diſorder by opening the Scrotum, and extirpating the offending Part only. But if it is rooted in the Teſticle, or cannot be taken cleanly off; it will be neceſſary, either to remove the whole Teſticle, or ſome Part of it [a]: After which, ſo much of the Integuments of the Scrotum, as are ſuperfluous, may be alſo extirpated with a Pair of Sciſſors, by which Means the Wound will heal with more Eaſe and Uniformity. With regard to the Dreſſing, that is to be made with ſcraped Lint and Compreſſes, ſecured by the Bandage *Spica Inguinalis*; and to abate the Inflammation, which ſometimes ariſes, a diſcutient Cataplaſm may be uſed, and the Wound afterwards treated with ſome digeſtive Ointment or vulnerary Balſam. Obſervations on Caſtration may be ſeen in TULPIUS, *Obſ. Lib.* IV. *Cap.* 32. and SAVIARD, *Obſ. Chir.* 125.

Method of treating an Excreſcence of the Teſticle.

CHAP. CXXII.

Of the HYDROCELE.

I. WE frequently meet with the Scrotum diſtended in ſome Subjects with a watery Humor, even ſometimes to the Size of one's Head; without Pain indeed, but exceeding troubleſome to the Patient: And this kind of Diſorder has been denominated, after the Greeks, an *Hydrocele*, or *Hernia Aquoſa*. For the Generality, but one Side of the Scrotum, though ſometimes

Hydrocele deſcribed.

[a] DIONIS and others recommend the Application of Cauſtics to remove Excreſcencies of this Part, which may ſometimes ſucceed tolerably well; but I am apt to think the Method by the Knife much more ready and ſafe.

both are diſtended with this Humour; to which all in general are liable, without excepting any Age or Sex; even the Infant is ſometimes born with this Tumor, or acquires it ſoon after Birth, as I have obſerved. But the Seat, or part occupied by this Tumor, is not always the ſame; for it is ſometimes included in the *Tunica Vaginalis*, or between the Teſticle, and its including Membrane, in ſuch a Manner, that the Teſticle is thereby concealed from the Touch, and ſeems to ſwim in the Humour, which in that Caſe probably ariſes from a Rupture in ſome of the lymphatic Veſſels of the Teſticle: At other Times the Humour is lodged immediately beneath the Skin of the *Scrotum*, as CELSUS obſerves (*Lib.* VII. *Cap.* 18.) encompaſſing both the Teſticles, particularly in new-born Infants and hydropical Subjects. But when the Seat of this Diſorder is in the cellular Membrane of the Scrotum, immediately under the Skin, it is diſtinguiſhed from the *Hydrocele* by the Name of *Hydrops Scrotalis*; which we ſhall therefore conſider by itſelf hereafter. Sometimes again, the Humour has been obſerved collected in the Proceſſes of the *Peritonæum* [a] above the Teſticles: And I remember to have found a large Quantity of an aqueous Liquor in a dilated Proceſs of the *Peritonæum*, upon a dead Subject that had an *Enterocele*. Sometimes the contained Liquor is of a ſanguine Hue, or is mere Blood extravaſated into the Scrotum, as I have ſeen by Accident: And this Species of the Diſorder may be not improperly termed an *Hæmatocele*, or *Hernia Sanguinolenta*, which was even not unknown to CELSUS (*Lib.* VII. *Cap.* 19.) But more of this hereafter.

Diagnoſis and Prognoſis.

II. The Hydrocele ſhews itſelf by certain Signs, whereby it is not only diſcoverable itſelf, but alſo diſtinguiſhable from other Ruptures. It may be diſcerned (1) from the *Hydrops Scrotalis*, in that the laſt retains the Print of the Finger, the Skin appears pellucid and diſtended, and often the Penis itſelf is much ſwelled; whereas in the Hydrocele the Penis is rather drawn inward, and the Skin corrugated, and ſuſceptible of no Impreſſion from the Finger: In the Hydrocele the Tumor often returns, and diſappears, and feels rough to the Touch, when the Humour is not too abundant; but the *Hydrops Scrotalis* is more fixed and reſiſting. The *Hydrocele* is alſo (2) diſtinguiſhable from the *Enterocele* and *Epiplocele*, in that the Teſticle is frequently drowned or concealed in the Water of the firſt; but may be always felt on one Side of the Tumor, in the two laſt. But (3) the Difference betwixt the Hydrocele and Sarcocele is not ſo obvious, but that it has deceived many expert Surgeons: The principal Criterion is the Difference in the Reſiſtance to the Touch, the Sarcocele being much harder than the other, and uſually leſs in Size. I am ſenſible, it is a general Admonition, in diſtinguiſhing this Diſorder, to hold a Candle on one Side of the Patient's Scrotum in the Dark; whereupon the Scrotum will appear in ſome Meaſure pellucid, like a Bladder full of Water: But as myſelf, with CELSUS and ÆGINETA, have frequently obſerved the contained Humours

[a] This has been obſerved by WIDEMANNUS (*de Litho & Celotomia, Pag.* 84.) BOERHAAVE (*Aphor.* § 1227.) GARENGEOT and LE DRAN (II. *Obſ.* 75.) and I myſelf have alſo felt the Water in one of the Proceſſes of the *Peritonæum* above the Teſticle: Which may ſometimes happen after an *Enterocele*, when the Inteſtine has penetrated into the *Tunica Vaginalis*, through the Septum, which divides the Teſticle above from the Proceſs of the *Peritonæum*. But this Caſe very ſeldom occurs; nor could I ever meet with the Parts in this State, among the many Subjects, which have been under my Care in both *Hydrocele* and *Enterocele*.

very

very turbid, bloody, or dark coloured, like Coffee; every expert Surgeon muſt be ſatisfied, that this Method is very fallacious, or at leaſt ought not to be over-much relied on. It is true, ſuch an Appearance will confirm us, that the Tumor is an Hydrocele; but when it does not appear, we can hardly be certain it is no Hydrocele, without other Aſſurances, as the Humours may be bloody and opaque. The Tumor itſelf is generally more troubleſome than dangerous; as it frequently obſtructs the Patient's walking, and prevents him either from ſitting or riding, when of any conſiderable Size. But if it continues a long Time together, there is danger of the Teſticle being corrupted or vitiated by the offending Humours, ſo as to give riſe to a Sarcocele, Scirrhous, or Cancer, of the Teſticle. On the contrary, I have ſeen ſome Inſtances of the Diſorder being ſuſtained with no bad Conſequences, and but little Incumbrance, during Life. But when the Penis is buried by a too great Diſtention of its Integuments, through a Redundancy of the Humours, it muſt at leaſt greatly obſtruct, if not totally prevent a Procreation of the Species. Nor is the Diſorder eaſily curable, either by Medicines or Inſtruments; but may be ſooner effected in a young Patient, than one advanced in Years. Sometimes the *Hydrocele* and *Hydrops Scrotalis* are joined together in one Patient; and then the Cure of the firſt is impracticable before a Removal of the laſt: To which we may add, that this Diſorder is alſo ſometimes complicated with a Sarcocele or Enterocele.

Cure by Medicines.

III. The Hydrocele is frequently curable by Medicines only, in young Patients; when a Courſe of Diſcutients and Corroborants are timely exhibited, and continued both externally and internally. The Application of Linen Compreſſes dipt in *Sp. Vin.* or *Aq. Hungar.* is found of great Service, as is alſo a Decoction of the warm and aromatic Herbs in Wine; to which may be added *Aq. Calcis* and *S. V.* at Diſcretion; which ſhould be applied warm to the Part for ſeveral Days together. Nothing can be more efficacious for removing the Hydrocele in new-born Infants, when they are well in other Reſpects, than giving them a little grated or chewed Nutmeg every Morning faſting, breathing frequently upon the Part every Day at the ſame Time: Which I ſhould have hardly recommended, but that I am convinced of many Cures performed by it on Infants. *Sp. Vin.* held in the Mouth, and breathed upon the Part, is alſo ſerviceable, and Compreſſes expreſſed out of warm *Sp. Matrical.* and applied ſeveral Times in a Day with *Emp. de Cumino*, is ſtill more powerful. For internal Medicines, it may be proper to purge the Patient at Intervals, eſpecially Infants, with *Rad. Rhabarb.* or ſomething that will ſtrengthen the Habit, as well as diſcharge the redundant Humours: And other corroborating and diuretic Medicines may be uſed between the Purges. The celebrated *Arcanum Duplicatum* of LUDOVICUS [a] is ſaid to be of ſurprizing Efficacy for the Hydrocele in Adults; inſomuch that a few Doſes of it continued, with external Applications, will totally diſſipate the Diſorder in a few Days: But I muſt confeſs, my Opinion is, it will be of more in the *Hydrops Scrotalis* than in the true Hydrocele. If the Diſorder is too obſtinate to give way to theſe Means, as it uſually is, when become inveterate in Adults, the laſt Remedy then left, is the Operation, which itſelf often fails of curing the Patient. When

[a] *Vide Miſcell. Nat. Curioſ. Dec.* I. *Ann.* 9 and 10. *Obſ.* 158. *& Opera ejuſd. Pag.* 720.

the Hydrocele is accompanied with an Inflammation, the Operation ſhould then be deferred till that is abated.

Cure by Operation.

IV. The chirurgical Treatment for curing the Hydrocele is of two Kinds; the one a perfect or radical Cure, the other only imperfect or palliative, according to the two-fold Intention in curing this Diſorder; *viz.* (1) of diſcharging the morbid Humours, and (2) of preventing their Return: To both which, the *Curatio perfecta* is equally accommodated; whereas the palliative Method regards only the Diſcharge of the retained Humours. But as the *Curatio perfecta* confines the Patient for ſeveral Weeks to his Bed, and is both painful, and in ſome Meaſure dangerous; it is not at all ſurprizing, that it ſhould be ſo frequently rejected for the palliative Method, which may be more eaſily and expeditiouſly performed, with much leſs Pain and Danger; for which Reaſon we ſhall here firſt conſider the *Curatio palliativa.*

The palliative Method of Cure.

V. The Lancet was in uſe among the Ancients for diſcharging the contained Humours; but the Moderns juſtly prefer the *Trocar*, *Tab.* XXIV. *Fig.* 1. which is much more convenient for the ſame Purpoſe. The Method of performing the Operation is this: The Patient ſtanding upright, or being ſeated on the Edge of a Chair, the contained Humours are then preſſed downward, from the upper Part of the Scrotum, to diſtend the lower; which is thus kept diſtended, by paſſing a flat Ligature gently about its upper Part: Next the Trocar, of about a Finger's breadth long, ſufficient to paſs through the Integuments, which are here thicker than uſual, is to be cautiouſly inſerted into the lower Part of the Scrotum, directing its Point outward, to avoid injuring the Teſticle. The Scrotum thus perforated, after drawing out the Trocar, the Cannula is left behind, to diſcharge the contained Humours; which done, the Cannula is alſo extracted, which compleats the Operation; the Wound being ſo trifling, as to heal of itſelf, without any Plaſter or other Medicine; and the Patient is then diſmiſſed to walk about his Buſineſs. Tho' it may not be amiſs to follow the Practice of ſome, who apply thick Compreſſes to the Scrotum, moiſtened in *Aq. Calc. & S. V.* after the Operation. But if contained Humours are alſo lodged in the Proceſs of the Peritonæum, above the Teſticle, they are to be alſo diſcharged by another Paracenteſis. And as the Scrotum will fill again within a few Months after the Operation, it will be neceſſary to repeat the Paracenteſis when there is another Occaſion; leſt the ſtagnating Juices ſhould contract an Acrimony, and affect the Teſticles and internal Parts, ſo as to excite a worſe Diſorder. Thus the Operation may be repeated in Proportion to the Return of the Diſorder, without much Trouble to the Patient, who I have ſometimes known ſurvive to a great Age [a]. Even in robuſt and young Subjects a perfect Cure will be ſometimes made by the firſt Extraction; but as thoſe Inſtances occur but ſeldom, this Method of Cure has been juſtly termed palliative only. If the contained Humours ſhould in proceſs of Time become diſcoloured, fœtid, acrimonious, or ſo thick, as not to paſs through the Cannula, or if they reſemble Blood, it will then be neceſſary to proceed to the *Curatio perfecta*; which GARENGEOT alſo adviſes, for the Removal of extravaſated Blood from a Wound in ſome of the larger Veſſels in the Scrotum, and in order to tie up the Veſſels.

[a] *Vide* SCULTETI *Armament. Chirurg.* Tab. XL. *Fig.* 2.

VI. There

VI. There are principally three Ways of operating for obtaining a perfect Cure of this Diſorder, each of which we ſhall deſcribe in order. The firſt is by laying the Patient on his Back on his Bed, or a Table, and ſecuring him by Ligatures or the Hands of Aſſiſtants, as in the Operation for Celotomy. The upper Part of the Scrotum is then divided on one Side, where the Humour is lodged, by the Scalpell G or I (*Tab.* I.) till a ſufficient Opening be made into the Cavity of the Scrotum, which may be ſafely divided down to the Bottom by the Inciſion Knife, and Director, or a Pair of Probe Sciſſors; and after diſcharging the Water, if the Teſticle appears ſound, the Cavity of the Scrotum is to be directly filled with ſcraped Lint, to be retained with proper Compreſſes, and the Bandage T. After removing this Lint, in the ſucceeding Dreſſings the whole Cavity of the Wound is to be treated with Digeſtives, that its callous Membrane or Lining may be caſt off, and the ſmall Veſſels laid bare and healed, to prevent their future Diſcharge of a like Humour. But if the indurated Sacculus is of too hard a Conſiſtence to be diſſolved by ſimple digeſtive Ointments, it may be proper to mix a little *Merc. præcipit. rub.* or it may be only ſprinkled on the Surface of the Ointment when ſpread on the Lint; and if that will not diſſolve it, the Surgeon may remove as much of the tougheſt Part of it, as he well can, with the Scalpell or Sciſſors; and treat the reſt with *Præcip. rub. cum alum. uſt.* upon ſome digeſtive Ointment; and when the Wound appears to be ſufficiently cleanſed, it may be healed up with ſome vulnerary Balſam. Sometimes an adipoſe Excreſcence appears in the Cavity of the Scrotum, which ſhould then be removed like the callous Lining. If the ſpermatic Veſſels ſhould appear tumified after opening the Scrotum, the Surgeon ſhould not precipitately conclude, that the Teſticle is therefore ſpoiled, and extirpate it, as uſeleſs, according to the Advice of ſome; when it is probable, thoſe Veſſels will return to their natural State again, without any farther Aſſiſtance. But when the ſpermatic Veſſels appear indurated, as well as tumified, and give the Patient intolerable Pain; they may then be tied up, and the Teſticle extirpated, as we directed in the Sarcocele. It ſhould be alſo obſerved, whether the enlarged Teſticle contains any Lymph or Matter, and if it does, it ſhould be rather opened and cleanſed, than haſtily and totally extirpated; becauſe it frequently heals again, and performs its uſual Office: But if it be found much indurated, or greatly corrupted, it is moſt adviſeable to remove it, as before, to prevent it from degenerating into a Cancer for the future. And laſtly, if the indurated Sacculus ſhould be above the Teſticle, from the Hydrocele being formed in the Proceſs of the Peritonæum; great Care ſhould be taken, in ſeparating it by the Knife, not to injure the ſubjacent Teſticle.

Curatio perfecta deſcribed.

VII. As many, who are afflicted with this Diſorder, will not ſubmit to the Operation, for fear of the Knife, the Scrotum may be conveniently opened, and the included Humours diſcharged by a Cauſtic. In order to this, a large Piece of Plaſter may be perforated in the Middle, and applied to the Side of the Scrotum; and the Cauſtic being laid on, the Perforation may be retained with a Linen Compreſs, another whole Plaſter, and the Bandage T, as we before directed in the Chapter on the Application of Cauſtics. If the Cauſtic is not quite ſtrong enough to penetrate through the Integuments of the Scrotum, the Eſchar may be divided by a Probe Scalpell, or other Inſtrument, to diſcharge the Water; and after cleanſing the Wound, and filling it with dry Lint, it may be

The ſecond Method.

be treated as before, till the Patient is recovered. And by this Method I have perfectly cured ſeveral. GARENGEOT is greatly afraid of the Cauſtic mixing with the included Humours, and affecting the Teſticle with malignant Symptoms; but his Fears have more an imaginary than real Foundation: For the Cauſtic no ſooner makes its way through the Integuments of the Scrotum, but it is preſſed out, and waſhed off by the diſcharging Water; and if any Part ſhould enter the Scrotum, it will be ſo diluted with the Humours, as to prove inoffenſive. Nor did I ever obſerve any ill Conſequence attend this Practice, though I have ſo often made trial thereof by Experience.

The third Method of operating.

VIII. The third Method of performing the *Curatio perfecta* in this Diſorder, is by paſſing a Ligature in a large Needle (like what we adviſed for the Seton, *Tab.* XVIII. *Fig.* 12.) through the upper Part of the Scrotum, on one Side, ſo as to avoid the Teſticle, and bring it out again through the Bottom [a]. The Ligature is then left in the Scrotum, as in a Seton, and drawn backward and forward once or twice every Day, after it has been rubbed with ſome digeſtive Ointment; by which Means the Humours are not only diſcharged, but the indurated Sacculus and ruptured Veins are alſo digeſted off; after which, the Ligature may be extracted, and the Wound healed, as before. If the Suppuration does not ſucceed well enough from the digeſtive Ointment on the Ligature, a little *Merc. præcipit. rub.* may be added as before. But as the peccant Humours and indurated Sacculus cannot well be this way perfectly diſcharged, nor any Obſervation made, whether the Teſticle is ſound or vitiated; the Reader will not be ſurprized to hear, that the two preceding Methods (*N°* 6. and 7.) are generally preferred and practiſed, as more ſafe and effectual than the preſent. For if any putrid Matter ſhould remain behind, the Teſticle prove ſcirrhous, &c. as in this Method it is very poſſible, the preſent Cure will be not only rendered precarious and uncertain, but the Patient probably ſubjected to a much worſe Diſorder for the future.

The Method of MARINUS and RUYSCH.

IX. MARINUS [b], an *Italian* Surgeon, thinks the following Method much preferable to any other, as it is moſtly uſed in that Country. The Patient being properly diſpoſed, the *Scrotum* is then divided in its upper Part immediately under the *Inguen*, by an Inciſion large enough to admit one's Finger, and afterwards a Tent of Wax, about three Fingers breadth long, and the Thickneſs of one Finger, the Point of which is to be a little crooked. This Tent is to be dreſſed with *Ung. de Alth.* and inſerted into the Cavity of the Scrotum, where it is to remain for the Space of twenty four Hours. This prevents the Water from returning; and therefore the Tent ſhould be gradually diminiſhed, as the Cavity is contracted, and the Tumor ſhould be dreſſed with an emollient Plaſter. When a good Suppuration enſues, the Tent is to be dreſſed with *Ung. digeſt. Galeni*, and *ung. roſat.* is to be conveyed into the Cavity of the Scrotum. In about ſeven Days Time the Sinus is to be cleanſed, and the Wound incarned and healed, keeping the Patient to a proper Regimen. Much the ſame Practice was alſo deſcribed before that Author by RUYSCH [c], who ſays, the Scrotum is to be opened in its upper Part on one Side, inſerting an oblong Tent, dreſſed with *Ung. roſac. cum Merc. præcip. rub.* till a gentle

[a] *Vide* SCULTETI *Armament. Chirurg. Tab.* XL. *Fig.* 1. where this is ſhewn.
[b] *Prattica della principali operazioni, &c.* Pag. 230.
[c] *Adverſar. Anatom.* Dec. II. 22.

Inflam-

Inflammation follows, attended with a mild Suppuration, whereby the Membranes, in which is the Seat of the Diſorder, will be digeſted off, and ſhould be extracted with a *Tenaculum*; by which Method I have known many obtain a perfect Cure. But it ſhould be obſerved, that the Practice theſe Authors recommend, will ſucceed only when the Teſticle is ſound: For if we are aſſured, or may reaſonably ſuppoſe it vitiated, it will be moſt adviſeable to follow the firſt or ſecond of the Methods here deſcribed, for performing the *Curatio perfecta*.

X. There is ſtill another Method practiſed by itinerant Medicaſters, by which they make an Inciſion in the Inguen, and tearing the Scrotum off the Teſticle, they extirpate it together with the Proceſs of the Peritonæum, notwithſtanding both of them are in a ſound State, as they alſo do in the Enterocele, which we before obſerved. But I think they ought to be ſeverely reprehended, and puniſhed for their Barbarity and Male-practice. To conclude, the *Curatio perfecta* will ſucceed beſt in young and robuſt Patients; but for thoſe who are infirm, and advanced in Years, the *Curatio palliativa* may ſuffice: But in either Caſe, the Surgeon ſhould be extremely careful not to miſtake an Enterocele for this Diſorder; leſt he ſhould wound the Inteſtine, to the Deſtruction of the Patient. Another Method.

An EXPLANATION *of the* TWENTY FIFTH PLATE.

Fig. 1. Repreſents a concealed Scalpell or Biſtory for dilating the Parts in Ruptures (in French *Biſtouri herniaire cachée*) which is alſo recommended by ſome, as well for cutting *Fiſtulæ* of the Anus, as for incarcerated Ruptures. A, the Scalpell concealed in the Groove, CCC, till elevated to divide the Parts by depreſſing the Handle B. DD, the Handle of the whole Inſtrument; E, the Screw or Hinge, about which the Scalpell and Handle are moved. F, the Spring that returns the Scalpell again into its Groove, when the Handle B is not depreſſed.

Fig. 2. Is the preceding Inſtrument, or *Scapellum Herniarium*, a little improved. AB, the Scalpell elevated out of its Groove CC; D, a flat Plate, in form of a Heart, to depreſs the Inteſtine, that it may not riſe above the Scalpell, and be wounded. E, the Handle, ſomewhat different from the former, as is alſo the Hinge and Spring.

Fig. 3. A, repreſents the Scrotum, moderately diſtended on the right Side, by an Enterocele; B, ſhews the Manner in which the Inteſtine CCC prolapſes, and is reduplicated in the Scrotum, which is here divided. The Figure is taken from BERENGERE's *French* Treatiſe on Ruptures.

Fig. 4. From the *Chirurgia* of PALFINUS. A, exhibits the upper Part of the Proceſs of the Peritonæum, not yet denudated in the *Inguen*, but laid bare by the Knife in its lower Parts BBBB. C, denotes the Teſticle, and E, its ſpermatic Veſſels; D, repreſents the Sacculus, being a Diſtention and Elongation of the interior Coat of the Peritonæum, formed by a Prolapſion of the Inteſtines, Omentum, or both, which are here extended almoſt down to the Teſticle.

Fig. 5, 6, *&c.* to 15. Repreſent various kinds of Truſſes, to compreſs the Parts, and prevent a Relapſe of the Inteſtine, when the Rupture has been reduced. Some of theſe (*Fig.* 6, 12, and 13.) are made of Callicoe, for Infants,

fants, or of Leather, for Adults: Others (*Fig.* 5, 7, 8, and 15.) are made of Steel covered with Leather. Some are made of ſteel Plates joined by Hinges, ſo as to be flexible and more eaſy, as in *Fig.* 15. Some are deſigned for Ruptures on both Sides, as *Fig.* 8. and 9. Some are for Ruptures on the right Side, as *Fig.* 6. and 7. Others for the left, as *Fig.* 5, 10, 13, 14, and 15. Some are faſtened upon the Body by tagg'd Laces, as in *Fig.* 9, 10, 13. Others by Straps and Buckles, as *Fig.* 6, 9, 13. Others by Hooks and Eyes, or Hooks and Straps, as in *Fig.* 5, 7, 8, 15. And others again, by different Contrivances, as in *Fig.* 11, 12. A, denotes the Bolſter or Compreſs in each Truſs, which is applied to the Ring of the abdominal Muſcles, after the Rupture has been reduced. BB, the Girdle or Belt of the Truſs, to be faſtened round the Body, either with Strings CC, paſſed through the Holes DD, or by Straps and Buckles, as in *Fig.* 6. and 14, EE; or with Hooks, as in *Fig.* 5, 7, 8, 15, aa. In many of theſe Truſſes there is a depending Girt, beſides that which paſſes round the Body, which is to be paſſed between the Legs of Women, and faſtened to the oppoſite Part of the Belt, as FF, in *Fig.* 5, 6, 10, 11, 12, 13, and 14. In *Fig.* 10. is ſhewn the Bolſter a. In *Fig.* 11. may be ſeen a wooden Bolſter cd; ee, the Button, by which it is faſtened to the Truſs; d, the convex Part, to be applied to the Rupture. There are many more Truſſes of various Forms, contrived by ſuch as make it their Buſineſs; but I have here only endeavoured to repreſent the beſt of them.

CHAP. CXXIII.

Of the HÆMATOCELE.

Hæmatocele deſcribed.

I. AN *Hæmatocele*, or *Hernia Cruenta*, is when the Scrotum is diſtended with Blood (alone or mixed with Lymph) inſtead of Water. This Diſorder has been obſerved, not only by myſelf and ſeveral other Moderns, but it has been alſo taken notice of by the ancient CELSUS [a], among the *Latins*, and PAULUS [b], among the *Greeks*. The Hæmatocele ſhews itſelf with the ſame Signs as the *Hernia Aquoſa* preceding; but if the Scrotum be viewed againſt a Candle, it does not appear pellucid, like that, but dark and opaque, or blackiſh. A ſtill ſurer Sign is, when in perforating the Scrotum by the Trocar or Knife, to diſcharge the Humours, Blood, or a bloody Lymph flows out inſtead of the Water.

Cauſe.

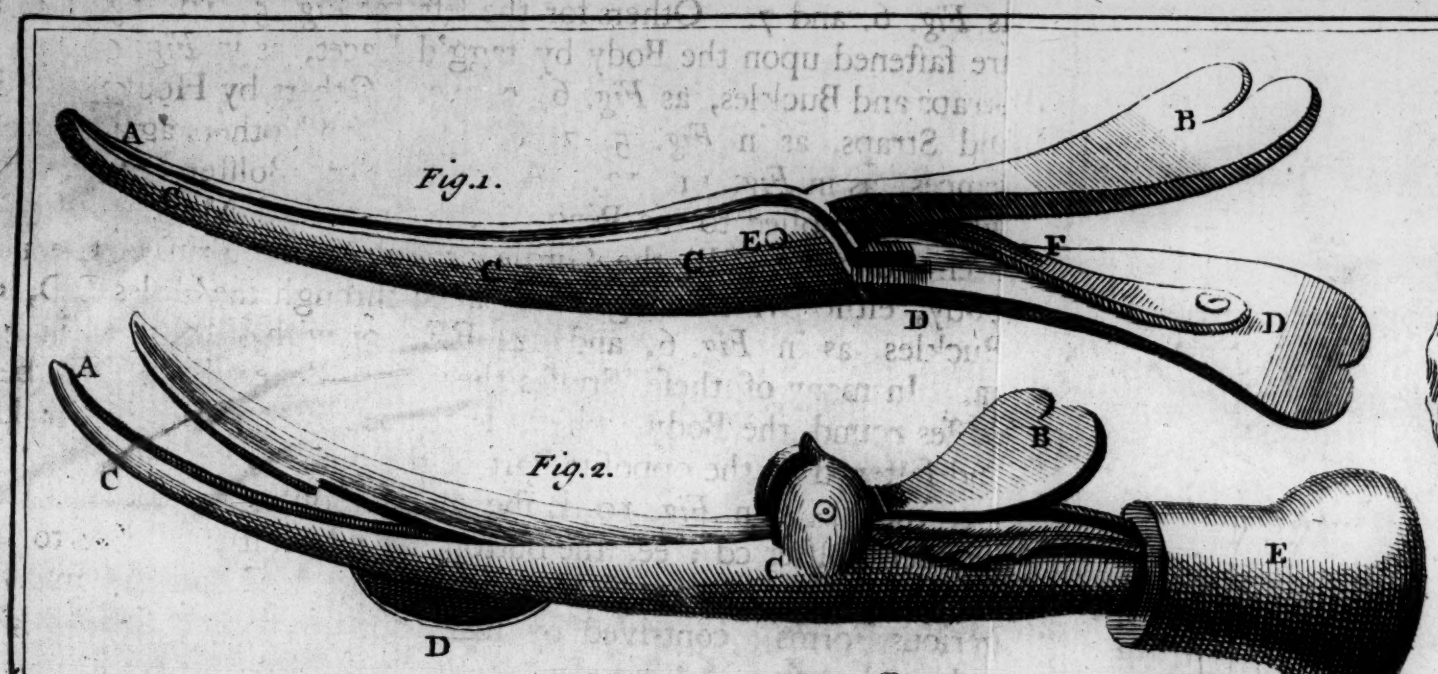
II. The uſual *Cauſe* of this Diſorder is ſome external Violence, whereby the ſmall Veins in the Scrotum are contuſed, lacerated, or burſt, ſo as to extravaſate their Blood into that Cavity: If it continues long in the Scrotum, it muſt neceſſarily putrify, and diſorder the Teſticle; from whence grievous Symptoms are to be feared.

Cure.

III. The beſt Method of treating this Diſorder for a Cure, is to open the whole diſordered Side of the Scrotum by a longitudinal Inciſion, to diſcharge the bloody Humours: After the Wound has been well cleanſed, if the Teſticle appears ſound, it may be immediately healed up again with ſome vulnerary

[a] *Lib.* VII. *Cap.* 19. [b] *Lib.* VI. *Cap.* 62.

Balſam:


A
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C
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Fig. 1.
A
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Fig. 2.

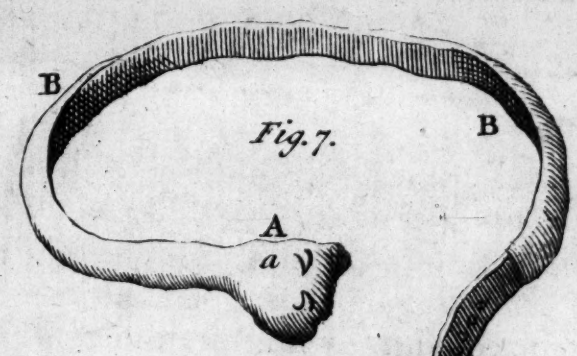
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Fig. 7.

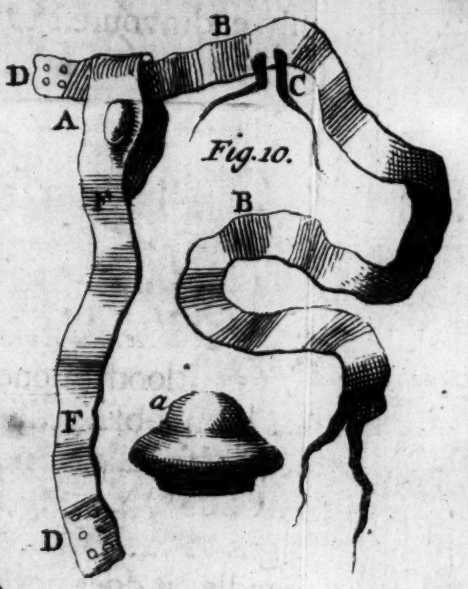
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Fig. 10.

G
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Fig. 11.

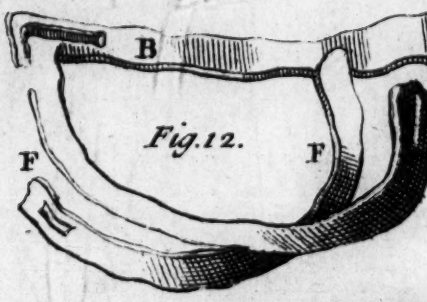
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Fig. 12.

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va
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Fig. 8

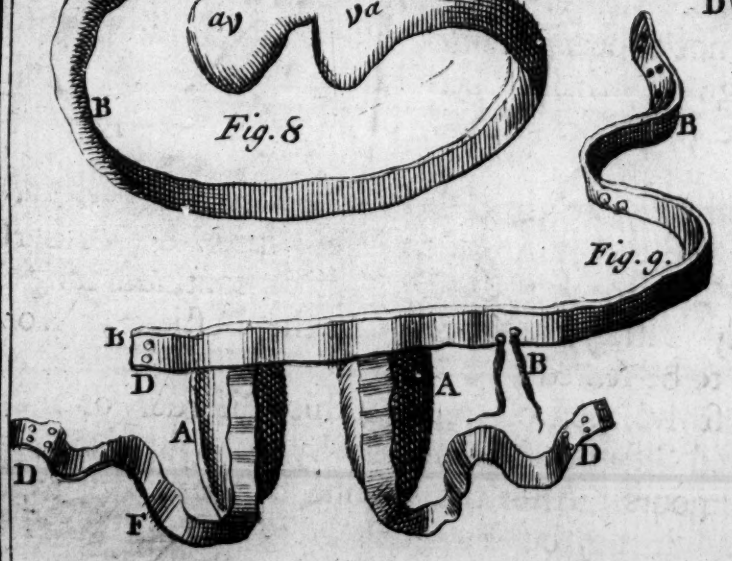
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Fig. 9.
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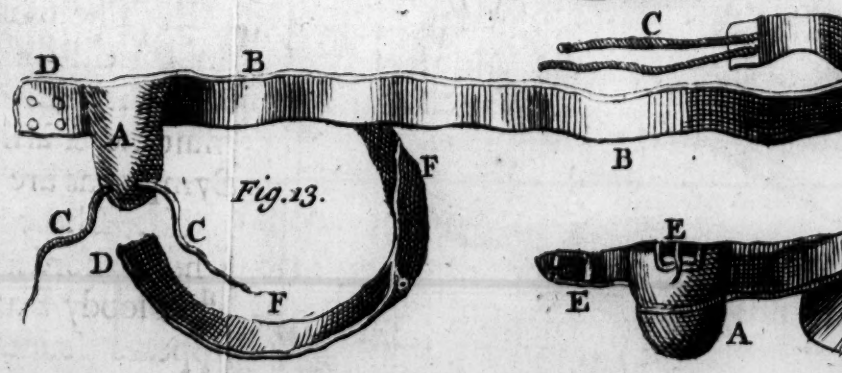
C
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Fig. 13.
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Fig. 3.

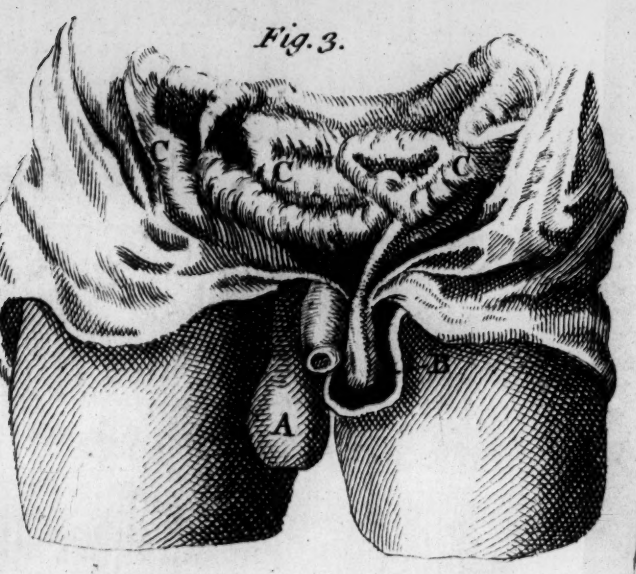
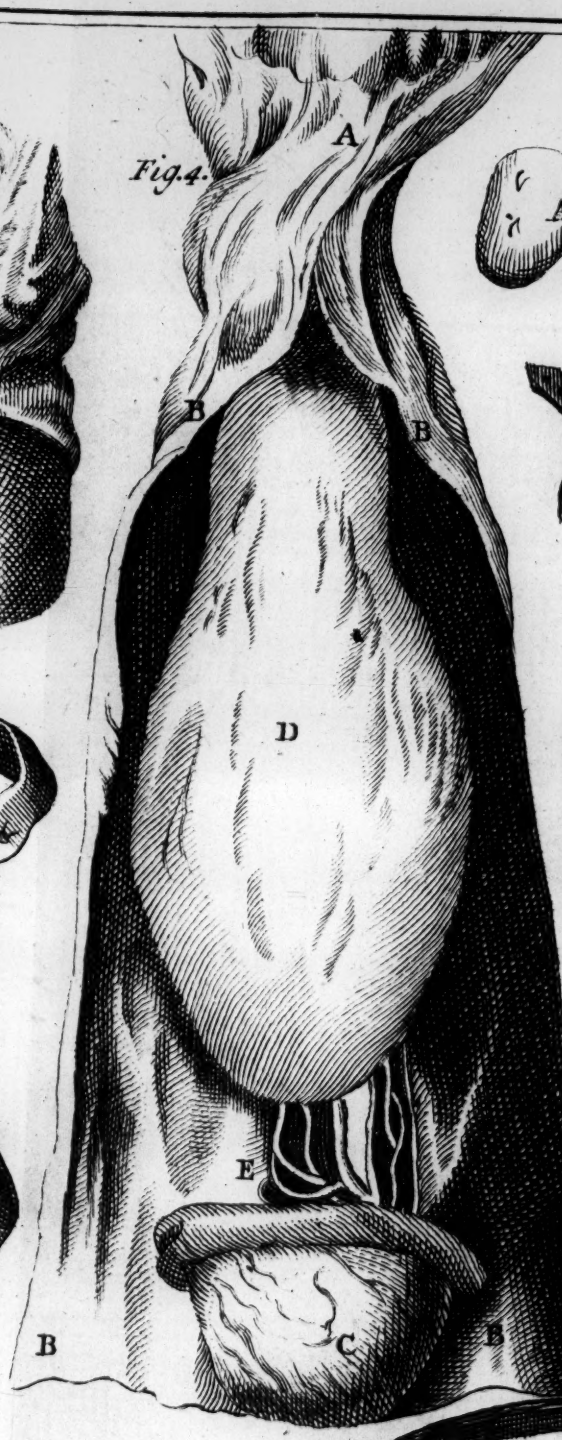


Fig. 4.



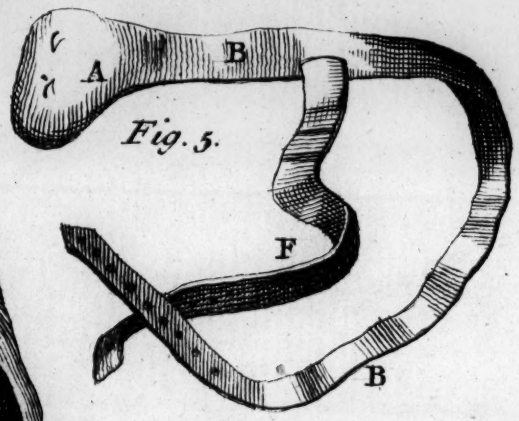
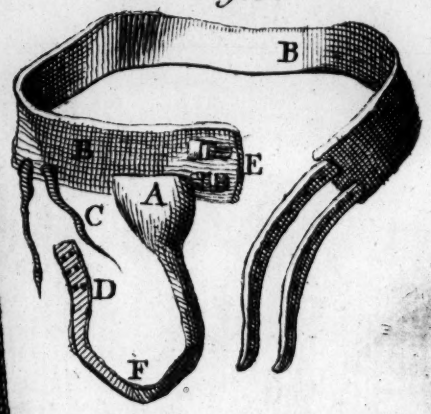
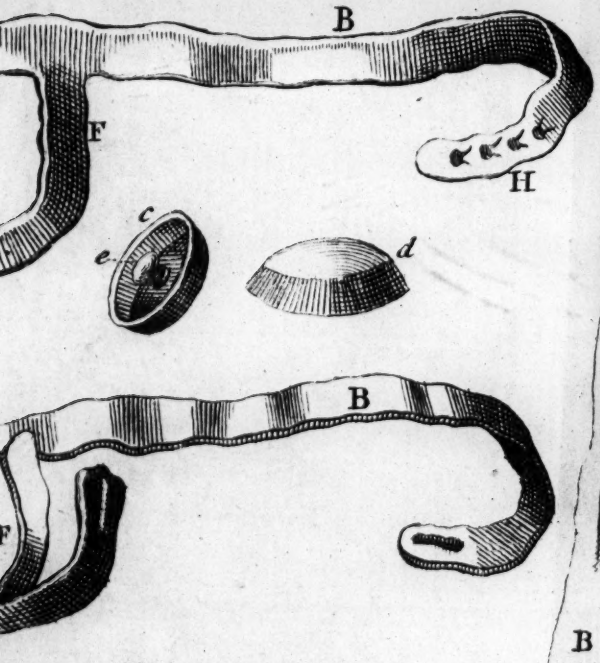


Fig. 5.

Fig. 6.





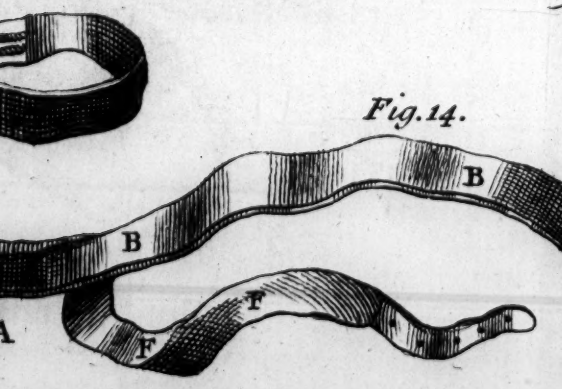
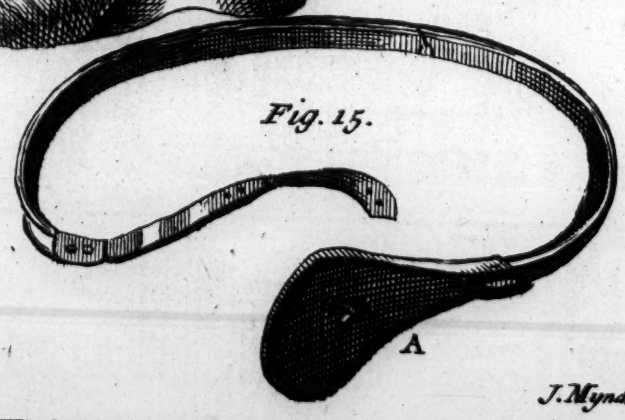


Fig. 14.

Fig. 15.



J. Mynde sc.

Balſam: But as the ſpermatic Veſſels are not corrupted ſo high as the Abdomen, a Ligature ſhould then be made about thoſe Veſſels in the Inguen, and the morbid Teſticle is to be extirpated as we have before directed.

CHAP. CXXIV.

Of the Hydrops Scrotalis and Pudendi.

THE *Pudenda* in both Sexes are often ſubject to dropſical Swellings, from a laxity of the Parts and redundancy of Water in the Blood, which inſinuating into the cellular Membrane next the Skin, makes it retain the Print of one's Finger, and ſometimes almoſt buries the Penis. When the Scrotum is chiefly affected, the Water is lodged between its external Coats, and particularly in the cellular Membrane, which diſtinguiſhes the Diſorder an Hydrocele. Sometimes the *Pudenda* alone are inflated with an hydropical Tumor; but it more frequently accompanies an *Anaſarca*, or dropſy of the whole Habit: In which Caſe a Cure can be hardly expected, until the general Diſorder is firſt relieved. But when the Caſe is only partial, the diſcutient and corroborating Medicines, which we propoſed in the Hydrocele, will be found of great Service; if uſed both externally and internally, and aſſiſted with a proper Regimen. Great Benefit will ariſe to the Patient from a repeated Application of warm Compreſſes, dipt in *Aq. Calc. & S. V.* with the other Applications recommended in a ſpurious *Œdoma*, *Part* I. *Book* I. *Chap.* XVIII. GARENGEOT thinks nothing better in this Caſe, than to ſcarify the Part, and apply *Emplaſt. Noriburgenſ.* full of ſmall Perforations, to give a Paſſage to the Water; for which Purpoſe, *Emp. de Cumino, & diaphoretic. Mynſichti* may be alſo uſed. The Scarification may be repeated at diſcretion, as the former grows dry: And if Scarification be not ſufficient of itſelf to diſcharge the Water, a kind of Seton may be made in the moſt depending Part of the Scrotum, according to the Direction of DEKKERUS, in *Exercitationibus Practic.* Pag. 290. An Inſtance of the Scrotum being perforated with Succeſs in this Diſorder, may be alſo ſeen in SCULTETUS, *Obſ.* 67.

CHAP. CXXV.

Of the HYDRO-SARCOCELE.

AN Hydro-ſarcocele may be diſcovered and diſtinguiſhed from a ſimple Hydrocele, by perceiving a fluctuating Humour about the hard Body of the Teſticle: Or by finding the Teſticle preternaturally enlarged and indurated, after the Water has been diſcharged. It is not eaſy to diſtinguiſh the Hydro-ſarcocele from the ſimple Hydrocele, while the Scrotum is diſtended with Water; for, unleſs the Water be very ſmall in Quantity, the Teſticle cannot be felt by the Fingers. If the Patient is only willing to be freed from the ſuperfluous Water, that may be eaſily done, as we have directed in the *Hydrocele ſimplex*; but when the Teſticle is greatly tumified, indurated, and painful,

painful, it will be neceſſary to remove the Sarcocele, as well as the Hydrocele, in the ſame Operation. Therefore the Proceſs of the Peritonæum ſhould be firſt denudated by the Scalpell, and a Ligature made about the ſpermatic Veſſels, and after freeing the *Tunica Vaginalis*, which is continuous with the Proceſs of the Peritonæum, from the Scrotum, the diſeaſed Teſticle is to be extirpated, and the Wound treated as before.

CHAP. CXXVI.

Of the HYDRO-ENTEROCELE.

AN Hydro-enterocele is, when after the Inteſtine is returned into the Abdomen, there ſtill remains a fluctuating and watery Humour on the ſame Side, near the Teſticle. But when the Hydrocele is on one Side, and the Enterocele on the other, they do not make one, but two diſtinct Diſeaſes. In this Diſorder, the Inteſtine is to be firſt returned into the Abdomen, and ſecured from a Relapſe; and then the Hydrocele is to be treated either by the *Curatio perfecta* or *palliativa* preceding, according to the Patient's Inclination and Judgment of the Phyſician. But great Care ſhould be taken, not to open the Scrotum before the Inteſtine is returned, and prevented from relapſing by the Hand of an Aſſiſtant; becauſe, it would then be ſubject to be wounded, at the Hazard of the Patient's Life.

CHAP. CXXVII.

Of the PNEUMATOCELE, *or* HERNIA FLATULENTA.

Whether ſuch a Diſorder is ever obſerved.

I. WE are aſſured by ſeveral Authors, that the *Hernia Flatulenta*, or windy Rupture, does ſometimes occur in Practice; but it is not, in my Opinion, rendered very probably, either from Reaſon or Obſervation. I am rather apt to think, they have been miſtaken, for want of Judgment and ſenſible Demonſtration; by which Means an Hydrocele or Enterocele has impoſed on them for a Pneumatocele. And I am the more confirmed in this Opinion, becauſe the Symptoms and Cure of the Diſorder, with which they acquaint us, agree exactly with thoſe of the Hydrocele. For my own Part, I have been ſeveral Times concerned in Caſes, where the Phyſicians and Surgeons have miſtakenly ſuppoſed the Patient's Diſorder a Pneumatocele, when in Effect it has proved to be one of the fore-mentioned. Thus MEEKREN, who was no unſkilful Surgeon, intitles the LI. *Cap. in Obſ. Chirurg. De Paracenteſi Scroti in Hernia Flatulenta*: From whence the Reader might imagine, that there was in reality ſuch a Diſorder; but if he goes through the Chapter, he will find, that Water, and not Wind, was diſcharged by the Operation.

Diagnoſis and Cure.

II. The Signs, by which thoſe Authors tell us a Pneumatocele may be diſcovered, are (1) that upon handling the Scrotum, it feels like a Bladder diſtended with Wind; and that therefore (2) it ſeems to be much lighter, than if it contained any Humour; appearing alſo pellucid at the Approach of a Candle; and

and laſtly (3) if it be ſtruck by a Fillip of the Finger, it ſounds like a Bladder, which is diſtended with Wind, and ſtruck in the ſame Manner. But for myſelf, I could never obſerve any thing of this Diſorder, though I have cured a great Number of all the other Kinds of Ruptures; which makes me ſuſpect, at leaſt, that the Caſe does not ſo often occur, as ſome would inſinuate; but whenever the Surgeon meets with it, he may proceed in the Cure, as follows. The Tumor may be treated externally, with the warm and diſcutient Medicines, which we adviſed in the Hydrocele; together with Fomentations and Plaſters; and internally may be taken carminative and gentle Purges: But if theſe take no Effect, and the Tumor ſtill increaſes, or continue the ſame, the Scrotum ſhould then be perforated with the Trocar, and its Contents thereby diſcharged, which will demonſtrate whether it was Wind or Water.

CHAP. CXXVIII.

Of the CIRSOCELE, *or* HERNIA VARICOSA.

I. THE ſpermatic Veins are often preternaturally diſtended, or divaricated, in the Proceſs of the Peritonæum, immediately above the Teſticle, and ſometimes higher up in the Scrotum, or even in the Groin; inſomuch that they reſemble the Inteſtines of a Bird, and equal the Size of a Gooſe Quill, with *varicoſe Nodes*, or Inequalities, thicker in one Place than another; by which Means the Teſticle appears much larger, and hangs down lower than it ſhould do: And this is the Diſorder, which has been uſually denominated by Phyſicians and Surgeons, a *Cirſocele*, *Varicocele*, or *Hernia Varicoſa*; though it might have been more properly termed *Varices* of the ſpermatic Veſſels. Sometimes alſo the Veins of the Scrotum are thus diſordered, as CELSUS obſerves; but ſuch a Dilatation of thoſe Veſſels cannot be properly named a Hernia, but rather, with FABRIC. *ab Aquapendente*, Varices of the Veins: However, both Caſes are frequently confounded, and improperly accounted one and the ſame Diſeaſe. Varicocele deſcribed.

II. The Cauſe of either of thoſe Diſorders is uſually thought to be in the Blood; being either too redundant in Quantity, or of a too thick and gluey Conſiſtence: So that by ſtagnating in too great Quantities in thoſe Veins, it occaſions them to be thus preternaturally diſtended. Frequently, the Diſorder alſo ariſes from ſome external Violence, whereby the Coats of thoſe Veſſels are contuſed, over-ſtretched, and weakened, and the Blood by that Means impeded in its Courſe. I have ſometimes alſo obſerved the Diſorder in young Men, who are very ſalacious, and overſtocked with Semen; in which Caſe, the Tumifaction has been moſt conſpicuous, at ſome Diſtance from the Teſticle, in the Scrotum: For a Quantity of Blood, much larger than uſual, being then ſent to the Teſticle, by the Artery, the Capacity of the Vein muſt, in Conſequence, be much enlarged or diſtended in Proportion. But whatever be the Cauſe of the Diſeaſe, it ſeldom gives the Patient much Trouble or Uneaſineſs: Nor is there any Neceſſity for the Uſe of Medicines, and much leſs any chirurgical Operation, except when it becomes intolerable to the Patient, by Cauſes.

violent Pains, and other Uneaſineſs, which render it neceſſary to make uſe of the ſubſequent Methods.

Medicinal Treatment.

III. If through Pain, or other Uneaſineſs, it becomes abſolutely neceſſary to try ſome Means; as in healthy Conſtitutions, the Diſorder may ariſe from a Redundancy of Semen in the ſpermatic Veins, the moſt ready and effectual Remedy will be Matrimony, which ſhould be therefore adviſed to the Patient. But if the Caſe ſhould happen to be in one already married, or that proceeds from ſome external Violence, there is but little Room to expect a Cure from Medicines, as the lacerated or over diſtended Veins do but very ſeldom, by that Means, recover their former Elaſticity and Vigour: However, ſuch topical Remedies may be diligently applied, which are known to attenuate the Blood, and ſtrengthen relaxed Parts; and for internal Medicines, it may be proper to call in the Advice of ſome ſkilful Phyſician. The Surgeon in particular ſhould bleed the Patient, and try the Application of thoſe aromatic and aſtringent Fomentations, which we directed in the Hydrocele, *Chap.* 122.

Treatment by the Knife.

IV. When other Means have proved ineffectual, and the Diſorder ſtill increaſes, or continues intolerable to the Patient; the Practice of the Ancients [a] was then to paſs a Ligature about the Veſſels, or apply an actual Cautery; but as that Treatment appears too ſevere, when the Varices are in the Integuments of the Scrotum, I ſhould rather approve of opening thoſe, which are moſt diſtended, the whole length of the Tumor; and after letting them diſcharge a few Ounces of Blood, to make the Dreſſing with ſcraped Lint, a vulnerary Plaſter, Compreſs, and proper Bandage; and to treat the Wound in the ſubſequent Dreſſings with ſome vulnerary Balſam: By which Means the inſpiſſated Blood will be not only diſcharged, but the Veſſels alſo rendered more firm and ſecure from future Diſtention, by the formed Cicatrix. But if the varicoſe Swellings are in the Veins within the Scrotum, the Integuments thereof, together with the Proceſs of the Peritonæum, are to be firſt divided, to diſcover the Veſſels, which are then to be treated as before. In the mean Time, the Patient is to be recommended to drink plenty of thin Liquors, uſe frequent Exerciſe, with attenuating Medicines, and to bleed, at leaſt, two or three Times in a Year: On the contrary, he is to be forbid all groſs and ſolid Food, with a ſedentary Life, as greatly conducing to inſpiſſate the Blood, and increaſe the Cauſe of the Diſorder. The ſame Regimen ſhould therefore be directed, as well to prevent the Diſorder from growing worſe, as for the Removal of it. The Practice of ſome, when the Tumor is very painful, is to make a Ligature about the ſpermatic Veſſels and Proceſs of the Peritonæum in the Groin, and then to extirpate the Teſticle, together with the varicoſe Veins: But if the Veſſels are indurated up to the Ring of the abdominal Muſcles, the Operation may be as well omitted, for Death is the uſual Conſequence.

[a] *Vide* FABRICIUS AB AQUAPENDENTE, *Cap. de Hernia varicoſa, in Operat. Chirurg.* and CELSUS, *Lib.* VII. *Cap.* XXII.

CHAP.

CHAP. CXXIX.

Of a Cancer and Sphacelus in the Teſticle.

IF a Scirrhoſity of the Teſticle ſhould degenerate into a Cancer, or an Inflammation into a Sphacelus, or if the whole Body of the Teſticle ſhould be ſuppurated from any other Cauſe; there is then left but one, and a ſevere Remedy, to prevent the Diſorder from ſpreading up to the Inguen, and into the Abdomen, ſo as to deſtroy the Patient: And that is, to extirpate the Teſticle, in the Manner we have explained, under Celotomy, in *Chap.* CXIX. and in *Chap.* CXXI. of the Sarcocele. But the Admonition of GARENGEOT in every Caſtration is here very remarkable; *viz.* That an Inciſion ſhould be made at the Ring of the abdominal Muſcles, and, after ſeparating the ſpermatic Veſſels, to make a Ligature about them, at the Ring, or a little above it, before the Surgeon proceeds to meddle with the Teſticle; which he ſays will facilitate the Cure, and give the Patient much leſs Pain: But for what other Reaſon he does not ſay. I ſhould rather imagine that ſuch an Inciſion would weaken the Part, and ſubject the Patient to a future Rupture, at leaſt: To ſay nothing of the violent Pain, which the Patient muſt ſuffer from making the Inciſion and Ligature near the Ring; where, if a Ligature were to be made, there would be great Danger of Inflammation, and its Conſequences internally. If ſuch a Practice ſhould be rendered neceſſary, from the Diſorder in the ſpermatic Veſſels having reached up to or beyond the Ring of the abdominal Muſcles, I ſhould even then think it moſt adviſeable to deſiſt from the Operation, as it never ſucceeds.

CHAP. CXXX.

The Method of treating a Diſorder of the PENIS.

Of a PHIMOSIS.

I. A *Phimoſis*, ſo called from the *Greeks*, is, when the *Præputium*, or Foreſkin of the Penis, is by a violent Inflammation rendered ſo ſtrict or tenſe, that it cannot be drawn back behind the *Glans*. This Symptom ſubjects the Patient to many bad Accidents, eſpecially when it confines a virulent Matter between the *Præputium* and *Glans*; which Matter being therefore incapable of a proper Diſcharge, as the Part cannot be cleanſed, breeds *Chancres*; and in proceſs of Time, as VERDUE obſerves, a Gangrene or Cancer, or at leaſt a violent Inflammation of the *Glans* and *Præputium*, till at length the Penis is either conſumed by thoſe corroding Ulcers, or is obliged to be amputated by the Scalpell. An *ardor urinæ*, or pain in making Water, is alſo a frequent Companion of this Diſorder, from an Eroſion of the *Glans* and *Urethra*. The *Cauſe* of this Diſorder is uſually communicated by Commerce with unclean Women; whereby the virulent Matter lodged in the Sinus's of the Vagina, inſinuates itſelf betwixt the Glans and Præputium, where remaining, it occaſions

Phimoſis deſcribed.

ſions an Inflammation, with the now mentioned Symptom, a Phimoſis; and poſſibly ſome of its Conſequences before enumerated. Though Inſtances are not wanting of a natural Stricture in the Præputium of this Part, in ſuch a Manner, that the Glans cannot at all or very difficultly be denudated [a]; but as the Diſorder neither obſtructs their making Water, nor the Procreation of Children, it does not require any Aſſiſtance from the Surgeon, unleſs an Inflammation or violent Pain, and Difficulty in the latter, ſhould make an Inciſion neceſſary. But then they, who have their Præputium naturally very long, are more ſubject to this Diſorder, and apt to retain the Infection, than others, as we learn both by Reaſon and Experience.

Treatment of the Phimoſis.

II. If the Phimoſis does not proceed from any infectious Cauſe, it may be ſufficient only to bathe the Parts, a conſiderable Time in warm Water; but if it be a venereal or foul Caſe, proper internal Medicines are to be exhibited at the ſame Time, as well as the Pain, and other Symptoms mitigated, by waſhing out the virulent Matter with warm Water, and an Injection frequently repeated, *ex decoct. hord. & mel. Roſar.* To diſperſe the Tumor externally, a diſcutient Fomentation or Cataplaſm may be afterwards applied to the Penis; not forgetting to bleed the Patient, according to his Habit and the Urgency of the Inflammation. After theſe Means have been uſed ſome Time, the Surgeon ſhould endeavour to draw back the Præpuce; which if he finds to be ſtill impracticable, and the Diſorder increaſing, it will be neceſſary to perform the Operation, to avoid expoſing the Patient to greater Injuries.

First Method.

III. In this Caſe, there are two Methods of operating; the firſt is, by drawing the End of the Præputium forwards, while the Glands is held by an Aſſiſtant; and the Surgeon preſſing back the Glands in the extended Præputium with the Thumb of his left Hand, divides the extended Skin of the Præpuce by the Scalpell or Sciſſors before the End of his Thumb, much in the ſame Manner as the *Jews* circumcize their male Children. This done, the Præpuce may be turned back without much Difficulty, and the Glans being laid bare, may be cleanſed, and healed of its Chancres.

A ſecond Method.

IV. Another Method is, to divide with a Pair of Probe Sciſſors ſo much of the Præpuce, as will ſuffice to denudate the Glans, after it has been extended as before. GUILLEMON, PALFYN, and others, prefer a kind of Knife for this Operation, repreſented in *Tab.* XXVI. *Fig.* 4. but what ſhould be the Reaſon of its particular Figure, and why a ſtraight Scalpell might not anſwer the Intention as well, I muſt confeſs I am at preſent ignorant. The Præpuce being thus divided longitudinally, ſome Surgeons amputate with a Pair of Sciſſors ſo much of the Extremity of the Præpuce as they think ſuperfluous. The Operation is uſually attended with a pretty plentiful Hæmorrhage, which ſhould not be ſtopped by Art, but permitted, according to the Patient's ſtrength, to abate the Inflammation: And then it is to be dreſſed with ſcraped Lint, and the Bandage proper for this Part. In the ſubſequent Dreſſings it may be treated like other Wounds, but ſhould not be healed too haſtily, nor cloſely, leſt there ſhould be Occaſion to repeat the Operation. When the Præpuce has been thus divided, the Glans is ſometimes drawn down by the Frenulum, ſo as to incurvate the Penis; in which Caſe, it may be proper to

[a] A Caſe of this Kind may be ſeen in *Hiſt. Acad. Reg. Scient. Ann.* 1706. *Pag.* 31.

divide

divide the Frenulum with a Pair of Sciſſors. If an incipient Mortification has ſeized upon the Glans, it will be neceſſary to often ſcarify the Parts affected, down to the ſound Parts, and apply a Fomentation of *Ægyptiac. & Theriac. in S. V. Camphorat. ſolut.* which ſhould be continued till the Gangrene diſappears. But if there ſhould be any of thoſe little obſtinate Ulcers called Chancres, no good can be done without Mercurials internally given, and often ſo as to raiſe a ſlight Salivation; at leaſt, the Patient cannot be ſafe under any other Method. I muſt not here forget to mention an Inſtrument, contrived by my intimate Acquaintance FRIEND, while I was at *Altorf*, for returning back the Præpuce, without Inciſion, in a Phimoſis: See *Tab.* XXV. *Fig.* 5. Where the Plates AA being inſerted under the Catis, and being gradually let out by the Screw B, do by their Elaſticity ſlowly dilate the Skin, till it may at laſt be turned back without Inciſion. But whether this Inſtrument will always anſwer the Expectation, I much doubt.

CHAP. CXXXI.

Of a PARAPHIMOSIS.

Paraphimoſis deſcribed.

I. WE now proceed to a Diſorder oppoſite to the former, which is from the *Greeks* called *Paraphimoſis:* Being when the Præpuce, from its natural Shortneſs, or a morbid Stricture, cannot be drawn over the Glans, but remains contracted behind it. In this Caſe, it is uſual for the Glans to be not only much tumified, inflamed, and painful, from the Stricture; but the free Circulation of its Blood being thereby obſtructed, will ſhortly bring on a Mortification, which will make an Amputation of the Part abſolutely neceſſary. Thoſe are moſt ſubject to the Paraphimoſis, who have naturally a ſhort Præpuce, and are too intenſe in their Embraces with Women, who have very ſtrait Paſſages, particularly Virgins: So that young Huſbands, who have ſometimes this Diſorder, are greatly miſtaken, when they think it ariſes from an Infection, contracted in deflouring their Wives; when in reality it proceeds only from the natural Shortneſs of their Præpuce, and the Stricture of Virginity. Boys are alſo ſometimes affected with this Diſorder, when they laſciviouſly draw back their Præpuce, being extremely narrow, and afterwards cauſing an Erection, it cannot be returned over the diſtended Glans; from whence I have ſeen a ſurpriſing Tumor of the Præpuce behind the Glans. But I would not have the Reader hence imagine, that the Paraphimoſis does not oftner ariſe from unclean Embraces: For the Præpuce being inflamed and tumified by the infectious Matter imbibed by it, generally produces this Diſorder, when it is alſo naturally ſhort. The Paraphimoſis is by the *Germans* called, from its external Appearance, a *Spaniſh Collar*.

Cure.

II. The Cure of a Paraphimoſis conſiſts chiefly in returning the contracted Præpuce over the naked Glans; which done, the Pain and other bad Symptoms quickly vaniſh. But as a violent Inflammation is uſually the chief Cauſe of its being ſo difficult to return the Præpuce in the Paraphimoſis, it may be firſt proper for the Surgeon to make trial of diſcutient and emollient Fomentations, or Cataplaſms, with *Sp. Vini Camphorat.* before he endeavours to draw the

the Præpuce over the Glans; which being effected, all the other Symptoms vaniſh in Courſe. However, ſome Surgeons prefer the uſe of cold Water to *Sp. Vini Camph.* or warm emollient Fomentations and Cataplaſms; becauſe the laſt often augment the Influx of Blood to the Parts, and ſo increaſe the Tumor. But when the Penis, Scrotum, and lower Part of the Abdomen, are immerged in cold Water, with plentiful bleeding, the Tumor generally ſubſides in a ſhort Time. The Penis is then to be held betwixt the Surgeon's two foremoſt Fingers of each Hand, and the Glans, having been firſt lubricated with Oil, or Butter, is to be forcibly preſſed back with his Thumbs, while the Præpuce is, at the ſame Time, drawn forwards under his Fingers, ſo as to cover the denudated Glans: In doing which, the Patient ſeldom fails to make heavy Complaints, of which the Surgeon ſhould either be regardleſs, or elſe diſpatch his Work the ſooner, as CELSUS adviſes. When the Præpuce has been brought over the Glans, there remains but little elſe to be done in the Caſe: If the Inflammation be not very large, it may be often ſufficient only to bathe the Parts in warm Water, when there is little or no virulency; otherwiſe, the Patient muſt be treated accordingly, as we before directed.

Treatment of a malignant Paraphimoſis.

III. But if the tumified Penis tends to mortify, through the Violence of the Inflammation, or long Continuance of the Diſorder; it will be moſt adviſeable to bleed the Patient firſt in the Arm, and then in the *Vena dorſalis Penis*; in which laſt, it ſhould be continued till the Tumor ſubſides, and then the Præpuce may be drawn over the Glans, as before. PETIT's Method in the Paraphimoſis, is to compreſs the Glans by a ſtrict Bandage, paſſed one Part through the other like the uniting Bandage; and when it is ſufficiently contracted, he reduces the Præpuce over it, as before. Sometimes the Præpuce is ſo much diſtended with the ſerous Part of the Blood, that it appears like a Bliſter raiſed by Fire, or a Veſicatory, ſeeming very pellucid, and conſpicuous to the Eye of the Spectator, and much obſtructing the Reduction of it over the Glans: And in that Caſe, it may be proper to make a few Punctures, with a Lancet or Scalpell, to diſcharge the diſtending Lymph; and after waſhing the Parts in warm Wine, the Præpuce is to be extended over the Glans, as before. But to prevent the wounded Præpuce from growing to the Glans, as it otherwiſe may; the Surgeon ſhould direct the Patient to frequently draw it backward and forward, and to wet his Glans over with his Urine, when he makes Water, which he ſhould continue, until there is no farther Danger of their adhering together. The ſame Intention may be alſo anſwered, with equal Advantage, by frequently waſhing the Glans, and internal Surface of the Præpuce with warm Wine, or by interpoſing ſoft Lint. But if by Accident, or Neglect, there ſhould be ſuch a Coheſion of the Glans and Præpuce, it ought to be immediately ſeparated by the Lancet or a proper Scalpell; but with great Caution, for fear of wounding the Glans, which would induce a large Hæmorrhage. This Caution of keeping the Glans and Præpuce free from each other, while they are ſo, is the more neceſſary, as it is with the greateſt Difficulty, that they can be afterwards ſeparated, when they are once firmly united. The Operation being finiſhed, the Penis is to be bound up to the Abdomen, leſt, if it ſhould hang pendulous, the Inflammation and Tumor might return, at leaſt in part. I remember, more than once, to have ſeen the tumified Præpuce,

behind

behind the Glans, ſo much indurated, that the Hardneſs could never after be removed.

IV. When all the preceding Means prove ineffectual, M. PETIT's Method of proceeding is to incite the diſtended or contracted Præpuce, by inſerting a ſmall and crooked Scalpell, with the Edge outward, and the Back towards the Glans: And thus he divides the Præpuce by Inciſion, in three, four, or more Places, according as the Degree of Diſtention, may make it neceſſary. And after waſhing the inciſed Parts in warm Wine, and reducing the Præpuce over the Glans, covered with a little ſoft Lint, the Penis is then bound up, and treated as before. PETIT's Method.

CHAP. CXXXII.

Of a CANCER *and* SPHACELUS *in the* PENIS.

IF a *Gangrene*, or incipient Mortification in the Penis, ſhould ſucceed a Phimoſis or Paraphimoſis, it ſhould be treated, as we have directed in *Chap.* CXXX. *N°* 4. But if a *Sphacelus*, or confirmed Mortification, or a *Cancer*, ſhould infeſt the Penis, after a Scirrhoſity of the Glans, the morbid Parts are, in that Caſe, to be immediately divided from the reſt, to prevent the Diſorder from ſpreading into the adjacent ſound Parts, to the Deſtruction of the Patient. To perform this, the following is the moſt convenient Method. Firſt, a ſmall Cannula, or Tube of Silver, or Lead, a little longer than the Part affected, is to be introduced into the Urethra, ſo as to paſs a little way beyond the unſound Part, which is to be divided: Then a ſtrict Ligature is to be made with Thread or Silk in the Sound, immediately behind the diſeaſed Part of the Penis, in the ſame Manner as in removing Tubercles and Wens, or fleſhy Excreſcences by Ligature. The inſerted Tube, in the mean Time, is to be ſo firmly ſecured in the Urethra, that it may not fall out, or be diſplaced, but afford a free Paſſage to the Urine. The Ligature is to be thus left upon the Penis for ſeveral Days, until the Part diſeaſed is thereby ſeparated, and falls off; but if the Ligature ſhould ſlacken in the mean Time, it may be made tighter every Day. I am not ignorant, that it is the Practice of ſome Surgeons to amputate the diſeaſed Part, before there is a ſpontaneous Separation made by the Ligature, and then to ſtop the Hæmorrhage with an actual Cautery or aſtringent Medicines [a]; by which Method ſome Patients have, indeed, been happily cured; but as ſuch a Practice ſeldom ſucceeds well, being uſually followed with malignant Symptoms, the Ligature, in my Opinion, ſeems to be much more preferable. It may be alſo obſerved here, that when a conſiderable Part of the Penis is left ſound and entire, the Patient may be ſometimes capable of Procreation afterwards, more or leſs, in proportion to the Length of the Part remaining. Thoſe who are deſirous of ſeeing ſome Inſtances of this Diſorder, may read SCULTETUS, *Obſ.* 60. and 65. HILDANUS, *Cent.* III. *Obſ.* 88. and RUYSCH *Obſ.* 30: But particularly DOEBELLIUS, who has wrote expreſly on the Diſeaſe, in a Treatiſe, publiſhed under the Title of *Relatio de*

[a] Such is the Practice of SCULTETUS, *Obſ.* 65.

Cole a cancro infecto, ſed per adhibitum ferrum feliciter curato. Lipſiæ, Anno 1698. 12°. *cum figuris.*

CHAP. CXXXIII.

The Manner of dividing the Frenulum of the PENIS.

THIS Operation is neceſſary, when the Glans is drawn down in ſuch a Manner by the Frenulum, that the Penis is thereby incurvated, ſo that it cannot be properly erected, and therefore renders the Patient incapable for Procreation [a]. The Operation may be alſo equally neceſſary, when the Penis is after the ſame Manner incurvated in a Clap, Phimoſis, or Paraphimoſis, as we have before obſerved. In both Caſes, the Frenulum of the Penis may be cautiouſly divided, either with the Sciſſors or Scalpell, almoſt in the ſame Manner, as we directed for dividing the Frenulum of the Tongue. After the Inciſion, the Wound may be dreſſed with ſcraped Lint, and the Penis bound in its natural Poſture with Paſtboard or Splints. But ſometimes the Penis is ſo incurvated, that it cannot properly be erected, notwithſtanding the Frenulum is ſufficiently looſe: But that proceeds from a Miſ-conformation of the internal Parts of the Penis; and is therefore very difficultly, if at all curable. If ſuch Men are deſirous of entering into a State of Matrimony, and becoming Fathers of Children; and for that End require the Aſſiſtance of the Surgeon; he may try what can be done, by the Application of Emollients to the contracted Side of the Penis, and of Aſtringents to the other Side; aſſiſting both with a proper Bandage, and ſometimes by making ſmall Inciſions in the Integuments of the contracted Side.

CHAP. CXXXIV.

Of Warts, and other Excreſcences of the PENIS.

THE ſeveral Tubercles and Excreſcences, which infeſt the Penis, are almoſt conſtantly the Effect of ſome venereal Diſeaſe preceding. The Seat of them is various: Some ariſing in the Præpuce, others in the *Corona Glandis*, and others upon the Body of the Glans itſelf. The generality of them reſemble a fungous or ſpongy Fleſh, and are very ſpeedy in their Growth; being ſometimes painful, and often not. The fitteſt Medicines for removing them are gentle Eſcharotics, as *pulv. Sabinæ*, either alone, or mixed with *Alum. uſt. & Merc. præcip. rub.* with which it may be ſufficient to ſprinkle the Part a few Times, or it may be mixed with *Ung. Baſilic.* or ſome other digeſtive Ointment, and then applied. If any of the Tubercles appear harder than ordinary, they may be gently touched every Day with *Lapis Infernalis*, till they are perfectly deſtroyed. If the Tubercle adheres by a ſlender Root, it may be conveniently taken off, either by the Sciſſors or Ligature, as we before adviſed, in

[a] See HILDANUS, *Cent.* III. *Obſ.* 54.

removing

removing other Warts and Tubercles. If the Excreſcence has too broad a Baſis to be conveniently removed by Ligature, with a hard and callous Apex; the Top of it only may be taken off with the Sciſſors, and after letting it bleed a while, and waſhing it with warm Wine, the Remainder may be taken down with *Lapis Infernalis*, as before. But the Method of deſtroying them by the actual Cautery, propoſed and uſed by SCULTETUS (*Obſ.* 65.) and FABRICIUS AB AQUAPENDENTE, is, in my Opinion, a Practice much too ſevere. To conclude, the Patient ſhould, in the mean Time, be treated with proper internal Medicines, to carry off the contagious and virulent Matter of the venereal Diſeaſe; otherwiſe, notwithſtanding their Removal, they will ſoon after break out upon the Patient again.

CHAP. CXXXV.

The Method of opening the imperforated GLANS *or* URETHRA.

I. THERE are uſually two Caſes, in which, the Glans or Urethra being impervious, ſhould be opened by the Hand of the Surgeon: *Viz.* (1) when the male-Infant is thus born; and (2) in a Coalition of the Extremity of the Glans in Adults, when they diſcharge their Urine behind it. We may conclude, that the Urethra is impervious in Infants, if we find no Urine diſcharged for the Space of ſeveral whole Days after the Birth; the Infant, in the mean Time, being conſtantly uneaſy, and crying; which as ſoon as diſcovered, ſhould be timely opened by Inciſion, to ſave the Life of the Infant, which would otherwiſe be certainly loſt in a ſhort Time. The Apertion is to be made differently, according to the particular Diſpoſition of the Parts preternaturally joined; for ſometimes there remain not the leaſt *Veſtigia* of the Urethra, while at other Times the Retention proceeds only from a thin Membrane: In which laſt Caſe, the Cure may be eaſily performed by a careful Diviſion of the Membrane with a Lancet, or the Needle before deſcribed (*Tab.* XVII. *Fig.* 5. or 6.) for couching a Cataract; and when the Urine has been thus diſcharged, a ſmall Tent dipt in *Ol. Amigd. dulc.* and faſtened to a Thread, may be inſerted into the Parts divided, or a Bit of ſmall Wax-candle may be introduced, and retained in the Urethra, to keep the Parts open. If the Membrane, which obſtructs the Urethra, is of a more thick and fleſhy Subſtance, the Perforation may be better made with the ſmall triangular pointed Bodkin of a Trocar, like that repreſented in *Tab.* XXVI. *Fig.* 6. which may anſwer the Intention beyond either a Lancet or the Cataract Needle; and then the Parts are to be alſo kept open, as before. But if there are not the leaſt Veſtigia, or Appearances of the Urethra, to be obſerved in the Glans of the Infant; it is a deplorable Caſe, which is commonly deſerted by the Surgeon, as incapable of any Relief: Though, in my Opinion, it is better to try a hazardous Operation in a difficult and dangerous Caſe, whereby there may be ſome Proſpect of a Recovery, than wilfully to neglect the Patient, and leave him to certain Death. I muſt therefore commend the Practice of thoſe, who in this Caſe alſo, perforate the Glans with one of the preceding Inſtruments, eſpecially when the Urethra appears diſtended behind the Glans: And thus a new Paſſage can be made,

How to perforate the Glans in Infants.

and kept open with a Tent, or Wax-candle, as before. If the Operation does not ſucceed, ſo as to give the Urine vent this way, there is then no Means left, but either the Infant muſt be given over to Death, or the Bladder muſt be opened above the *Os Pubis*, or below *in Perinæo*, as we ſhall preſently deſcribe in the Chapter on the Puncture of the *Perinæum*. But whether this laſt Operation was ever performed for this Diſorder in Infants, I am not certain.

Method of proceeding in Adults.

II. There are alſo ſeveral Caſes, in which the Aſſiſtance of the Surgeon may be neceſſary, to make a Paſſage through the impervious Glans of Adults. Sometimes the Urethra is indeed pervious, but in ſuch a Manner, that it does not paſs through, and terminate at the End of the Glans, but rather in ſome Part of the Penis behind the ſame, at various Diſtances from the Glans, even ſometimes diſcharging itſelf in the *Perinæum*. Sometimes the Urine is diſcharged by two Apertures [a], one in the Glans, and another in ſome Part of the Urethra, behind the ſame; which is generally a native Diſorder, from a Miſ-conformation in the Womb, and grows up with the Patient from the Time of Birth. Though it muſt be owned, that it may ſometimes ariſe from an Ulcer or Wound in the Penis, which penetrates into the Urethra, either by cutting out a Stone in that Canal, or to make way for the Urine, which is retained by a Calculus there; in which Caſe, a Paſſage is ſometimes made naturally by an Ulceration from the Calculus, and Acrimony of the Urine. Theſe preternatural Apertures in the Urethra are all of them very difficult to cure; but the more ſo, as they are larger, and nearer the Bladder: And if the Opening be very large, there is no Poſſibility of healing it. Thoſe who have their Penis perforated in this Manner, very near the Abdomen, are abſolutely unfit for Matrimony, and incapable of propagating their Species; but thoſe are not ſo, who have this Perforation about the Middle, or towards the Extremity of their Penis. Theſe laſt may indeed celebrate the Rites of the Marriage-bed, in all Reſpects, ſo as the moſt ſubtle Parts of the *Semen* may have an Opportunity to paſs into the *Uterus* [b]. A Surgeon ought therefore to be very circumſpect, in paſſing Judgment upon Caſes of this kind, with Regard to Impotency and Divorce, before a Court of Judicature. If the Urine has a free Paſſage through ſome Part of the Glans, tho' it be not in its right Situation, there will be no Neceſſity for the Operation, which may be of dangerous Conſequence to the Patient, by wounding the Glans; which if it does not inflame, is always attended with a profuſe Hæmorrhage. But if the *Urethra* has an Opening, either behind the *Glans* or the *Frenulum*, there are then two Things requiſite to be performed by the Surgeon: (1) To make a decent Perforation through the Glans, as we before directed; and (2) to agglutinate and heal up the morbid Opening.

First Method of operating.

III. There are two principal Methods of perforating the Glans, which we ſhall here briefly deſcribe, deſignedly omitting thoſe, which are leſs commodious, and therefore not worth our Notice. The firſt way of operating is to divide the Urethra by a longitudinal Inciſion with the Scalpell, begun at the morbid Opening, and continued through the Glans, ſo as to lay the *Corpora Caver-*

[a] A Caſe of the *Meatus urinarius* opening betwixt the Back of the Glans and the Præpuce, may be ſeen deſcribed by RUYSCH, *Theſaur. Anat.* VIII. *Pag.* 21.

[b] PAULUS (*Lib.* VI. *Cap.* 54.) adviſes to amputate the Glans in this Caſe.

noſa

noſa bare, without wounding them. The wounded Parts ſhould be permitted to bleed plentifully, in proportion to the Patient's Strength and Conſtitution, in order to prevent a future Inflammation in them: After which, if the Hæmorrhage does not ceaſe ſpontaneouſly, the Wound may be filled pretty tight with dry Lint, and the Dreſſing compleated with Plaſter, Compreſs, and Bandage. In about four and twenty Hours Time after the Operation, the firſt Dreſſings may be removed, and a poliſhed leaden Tube inſerted, ſo as to paſs through the Glans into the Urethra, beyond the morbid Opening; which is to be there continued till the Cure is compleated, for the Extramiſſion of the Urine. The callous Lips of the morbid Opening are then to be gradually removed, by repeated Scarifications, or rather by amputating them with a Pair of thin Sciſſors; for the thinner the Blades of the Sciſſors are, the more eaſily do they divide the Parts, and diſpoſe them to a more ſpeedy Agglutination. The union of the wounded Parts may be alſo greatly promoted, by keeping them together with ſome Pieces of ſticking Plaſter: But the Body of the Penis ſhould not be bound ſo ſtrict, as to intercept the Blood's free Circulation, which would cauſe it to tumify; nor ſo ſlack, as to let the Lips of the Wound recede from each other. The Dreſſing is next to be compleated with Plaſter, Compreſs, and Bandage; and the Cannula ſecured, that it may not be moved out of its Place; to prevent which, the Patient ſhould be directed to be quiet in Bed, and adviſed to abſtain from Drink for a few Days, leſt by frequent making Water the Cure ſhould be retarded, if not fruſtrated, and by the Urine inſinuating through the Wound, at leaſt give the Patient great Pain, and prevent the Plaſters from ſticking. Nor ſhould the Dreſſings be taken off, without urgent Neceſſity, during the firſt three or four Days; and even then, they ſhould be removed with great Tenderneſs and Circumſpection, to avoid ſeparating the Lips of the Wound, which are as yet but ſlightly cloſed. If the Wound be once perceived to unite, the ſame Plaſter ſhould ſtill be continued on for a few Days longer; otherwiſe, a freſh one may be applied, and the Parts retained more cloſely together; compleating the Remainder of the Cure, as we have often directed before, in other Wounds.

IV. The other Method of perforating the Glans, is by directing the ſharp triangular pointed Bodkin of the Trocar (*Tab.* XXIV. *Fig.* 2. or *Tab.* XXVI. *Fig.* 6.) through the proper Part of the impervious Glans into the Urethra, and letting the Wound bleed, as before: A long and ſlender Tent of ſcraped Lint is to be introduced, and the Part dreſſed up, to prevent farther Hæmorrhage; which being ſtopped, the Perforation may be kept open with a Piece of Wax-candle, as in the preceding Method. The next Day may be inſerted a Tent, armed with ſome digeſtive Ointment; but with this Caution, that it be not preſſed beyond the old Orifice, ſo as to prevent the Urine from being thereby diſcharged, when there is Occaſion, before the new Paſſage is cicatrized: Otherwiſe, by paſſing into the new Wound, it would give great Pain to the Patient, and much retard the Cure. The Urine ſhould be therefore permitted to paſs thro' the old Courſe, till the new one is cicatrized; to promote which, a Piece of Wax-candle is to be introduced, and dreſſed twice a Day with ſome deſiccative Ointment. The new Paſſage through the Glans being thus cicatrized, the old one may have its callous Lips ſcarified, or amputated, and then ſtrictly retained together, until they are united and healed upon the leaden Cannula, as before; after

Second Method.

after which, extracting the Cannula, the Cure is compleated. Sometimes the old preternatural Opening is ſo callous, and obſtinate, as not to heal by any Means; but even then, perforating the Glans, in this Manner, is not without its Advantages; for the Patient will be hereby rendered much more able to ſucceed in his conjugal Function, as a great Part, if not all the Semen, will be more perfectly directed into the Uterus; and thus ſome may be happily ſupplied with a deſired Progeny, who have been many Years ſterile, by this preternatural Defect. But there is one Obſervation very neceſſary, during the Cure of this Diſorder, and that is, to bleed the Patient at Intervals after the Operation, eſpecially, when he is of a robuſt and full Habit; otherwiſe, the Patient is in Danger of having an Erection, which may lacerate the Lips of the Wound newly cloſed, and undo the whole Work.

Concerning the Suture and Cauſtics in this Diſorder.

V. I am not unacquainted, that ſome Surgeons prefer ſtitching together the Lips of the wounded preternatural Aperture; and that others are for removing the Calloſity of them, rather by Cauſtics than by Inciſion; but neither of thoſe Methods can well be approved of in a rational Practice: For the Stitches of the Suture, breaking out, as they uſually do, will rather enlarge the Wound than unite it; and the Uſe of Cauſtics here will be condemned by every body, acquainted with their uncertain Operation, the Structure of the Part, and the great Pain or Inflammation they may this way bring upon the Patient.

CHAP. CXXXVI.

The Method of curing an Incontinency of URINE *in Males.*

Cauſe and Treatment of the Diſorder.

I. THE Neck of the Bladder is ſometimes ſo much weakened in many of the male Sex, that they are thereby rendered incapable of retaining their Urine, often diſcharging it involuntarily, either ſleeping or waking, attended with many other Inconveniencies. This Incontinency may proceed from two Cauſes, which are not unfrequent: *Viz.* (1) a Stone in the Bladder; or (2) a relaxation or paralytic Affection of the *Sphincter Veſicæ*. When the Diſorder proceeds from a *Calculus*, there is no Remedy but Lithotomy, or an Extraction of the Stone. Nor is it often curable by Lithotomy, in as much as that Operation is frequently the Cauſe of the very Diſorder itſelf. But when it ariſes from a Weakneſs of the Sphincter, the moſt likely Method of ſucceeding in its Removal, will be by the Uſe of corroborating, and nervous Medicines.

II. But as the Diſorder often receives no Relief from the beſt Endeavours of Phyſicians; Surgeons have therefore contrived various Inſtruments for retaining the Urine, that it might not be conſtantly dribbling, to the great Detriment of the Patient. Some are for adviſing the Patient to carry a Leather Bottle, or Bag, lined with Pitch, and of ſuch a Figure, as to lie commodiouſly between the Thighs, being capacious enough to hold about half a Pint; others are for faſtening a braſs or ſteel Pot of the like Nature, to the Penis, repreſented in *Tab.* XXVI. *Fig.* 7. which are to be emptied when near full. But as thoſe Receptacles cannot be conſtantly retained upon the Part, taken off and on, and carried about by the Patient, without great Trouble and Inconveniencies; ſome

ſome of our modern Surgeons have therefore invented more tight and eaſy Inſtruments, whereby the Penis and Urethra are gently compreſſed, ſo as to retain the Urine in the Bladder, and diſcharge it by Day or Night at Pleaſure, with little more Trouble than in the ordinary way, by opening and ſhutting the little, light, and eaſy Inſtrument, called a *Yoke*, exhibited in *Tab.* XXVI. *Fig.* 8. which is lined with Leather, and taken from NUCK. One of theſe Inſtruments, ſtill more convenient, is repreſented by *Fig.* 9. which may be tightened and relaxed, according to the different Size of the Penis, having been frequently uſed with Succeſs in many of theſe Caſes, by my own Experience, and never before delineated by any Perſon that I know of.

Contrivance of NUCK and WINSLOW.

III. A kind of Inſtrument was formerly publiſhed by NUCK, and not long after by WINSLOW, for this Diſorder, being a Sort of ſteel Truſs, to be applied almoſt in the ſame Manner as in Ruptures, which we have repreſented from NUCK, in *Tab.* XXVI. *Fig.* 10. It is to be faſtened to the Body, ſo that the Bolſter F may compreſs the *Urethra in Perinæo*. Thus by turning the Screw D, the Urethra may be compreſſed or relaxed, and conſequently the Urine diſcharged or retained at Pleaſure: But though I am not for rejecting this Method altogether, I cannot but approve of the Yoke, as much more eaſy and commodious, of which I have often had Experience.

An EXPLANATION *of the* TWENTY SIXTH PLATE.

Fig. 1. Repreſents an *Enterocele* on the right Side, as it appears before any Inciſion is made in the Integuments, out of MAUCHART's *Diſſertat. de Hernia incarcerata Scroti*, from whence the two ſubſequent Figures are alſo taken.

AA, the Thighs drawn aſunder, that the *Hernia* may be more diſtinctly viewed. B, the right *Inguen* diſtended by a Prolapſion of the Inteſtine. C, the ſound *Inguen* on the left Side, more plain and depreſſed than the other. D, the Penis, drawn inward, as it uſually appears in this Diſorder. EE, one Side of the *Scrotum*, very much ſtretched or diſtended from the Inguen almoſt down to the Bottom.

FF, the Bottom of the Scrotum, neither tenſe nor diſtended, in which the Teſticles may be felt ſeparate, and not confuſed with the Inteſtine. GG, the other Side of the Scrotum, in its healthy Form and Appearance. HH, the *Raphe*, or Suture, that divides the Scrotum in its Middle.

Fig. 2. Repreſents the right Side of the Scrotum laid open by Inciſion. AA, the *Cutis* divided perpendicularly, and drawn to each Side, that the included Parts may come into view.

BB, the *Membrana Adipoſa* divided, and drawn aſide, in like Manner. CC, the Ring of the oblique external Muſcle of the Abdomen, which being preternaturally dilated, admits the *Peritonæum*, or Sacculus, with its included Inteſtine, to fall through.

DD, the aponeurotic Tunic of the Teſticle called *Dartos*, which inveſts the whole external Surface of the Sacculus, including the Teſticle and Inteſtine, divided in the Middle, and ſeparating the Sacculus, which adheres to it internally, and then drawn to each Side.

E, the cellular Membrane conſpicuous betwixt the preceding and the internal Lamen of the *Peritonæum*.

F, the

F, the ſame cellular Membrane inflated by a Blow-pipe.

G, the internal Membrane of the Sacculus, formed by a Dilatation of the interior Lamen of the *Peritonæum*, immediately containing the Inteſtine, and divided in the Middle, ſo that the Inteſtine appears to Sight, marked HH.

Fig. 3. Repreſents the Situation of the Inteſtine, and other Parts in the *Scrotum*, in an *Enterocele*, together with the internal *Sacculus Hernialis*.

A, tendinous Fibres from the *Aponeuroſis* of the oblique external Muſcles, marked DD, in the preceding Figure.

B, the external Lamen of the *Peritonæum*, turned a little outward, which being continued through the Ring of the Abdomen, or elongated over the ſpermatic Veſſels, is termed the Proceſs of the Peritonæum, or *Tunica Vaginalis* of the Teſticle; but when preternaturally diſtended, it makes, in Conjunction with the aponeurotic Membrane (DD *Fig.* 2.) the external Part of the *Sacculus Hernialis*.

C, the interior *Lamen* of the *Peritonæum*, preternaturally diſtended, and protruded into the *Scrotum*, forming the internal Membrane of the *Sacculus Hernialis*, immediately containing the Inteſtine.

DDD, the ſame internal Lamen continued to the *Septum*, formed of the *Tunica Vaginalis*, which parts the Teſticle from it above.

EE, the Sides thereof drawn aſunder, to ſhew the Courſe of the ſubjacent ſpermatic Veſſels.

FF, the *Tunica Vaginalis*, looſely inveſting the Teſticle, opened, ſo as to ſhew G, the Body of the Teſticle, now covered with only the *Tunica Albuginea*.

H, the *Epididimis* upon the Top of the Teſticle.

II, the *Corpus Pampiniforme*, or Twinings of the ſpermatic Artery and Vein betwixt the external and internal Lamen of the *Peritonæum*, continued through the Ring of the abdominal Muſcles.

L, the Canal, which conveys the Semen from the Teſticle, called *Vas deferens*.

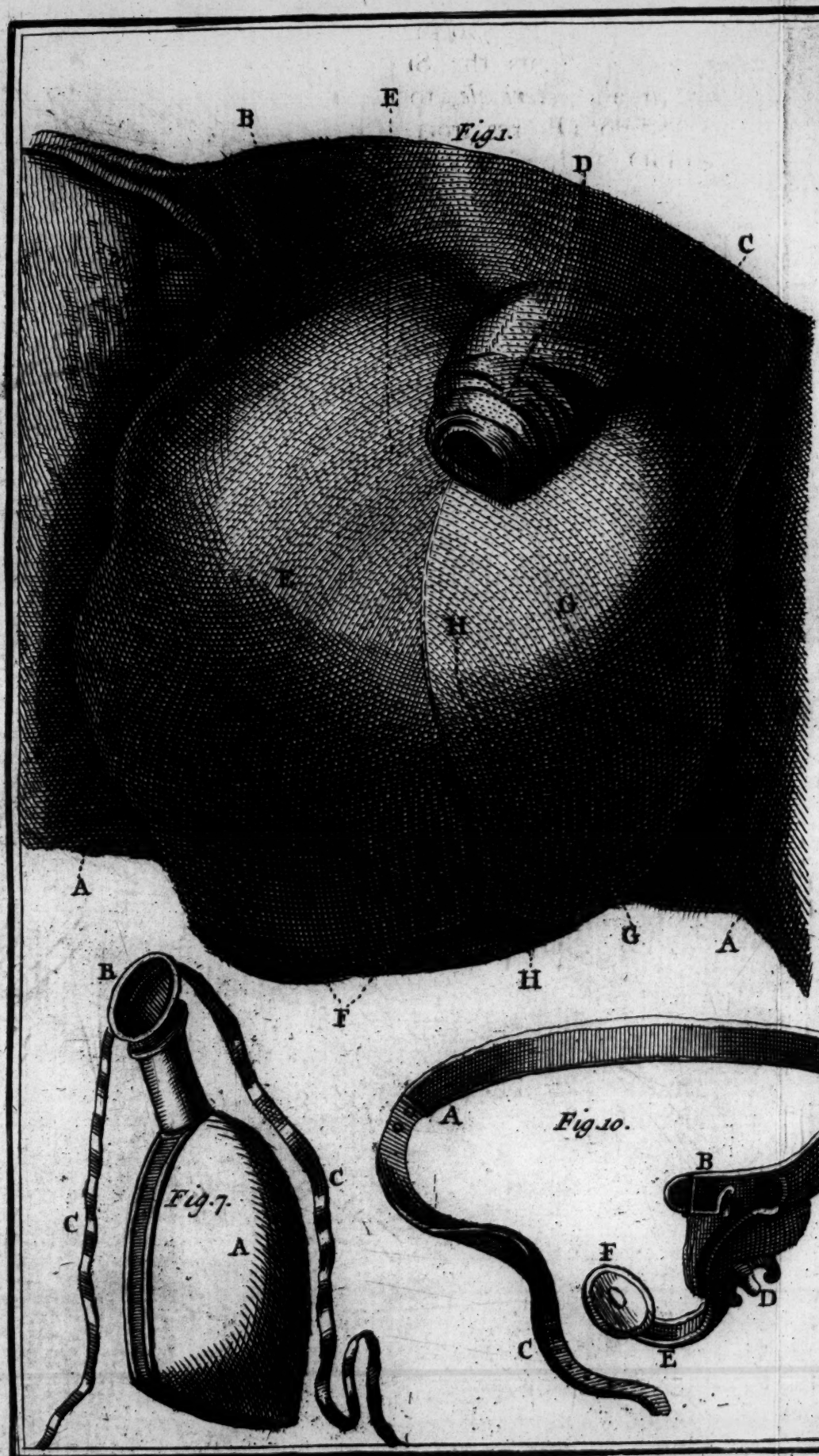
MM, part of the *Inteſtinum Ileum* variouſly convoluted and included in the Sacculus of the Peritonæum, which is here removed.

Fig. 4. Is the Scalpell contrived by GUILMEAU, or at leaſt deſineated by him, for dividing the Præpuce in a *Phimoſis*, in order to denudate the *Glans Penis*. Another Scalpell of the ſame Form, but not ſo crooked at the Point, is repreſented by PALFYN, in his *Chirurgia*, *pag.* 176. where the Point is alſo armed with a little Ball of Wax.

Fig. 5. The Inſtrument contrived by Dr. TREW, for returning the contracted Præpuce in a *Phimoſis*, without Inciſion: AA, are two elaſtic Plates, which are contracted or dilated by the Screw B.

Fig. 6. Is a ſmall Trocar, or triangular pointed Bodkin, for perforating the impervious Glans of the Penis; which may be uſed eſpecially in Children, and new-born Infants.

Fig. 7. Repreſents the braſs or ſteel Receptacle, recommended to be faſtened betwixt the Thighs for receiving the Urine, in Caſes of Incontinency. It ſhould be large enough to hold about half a Pint. B, denotes the Mouth and Neck of the Veſſel to receive the Penis, and which is to be faſtened round the Body by the Ligatures cc.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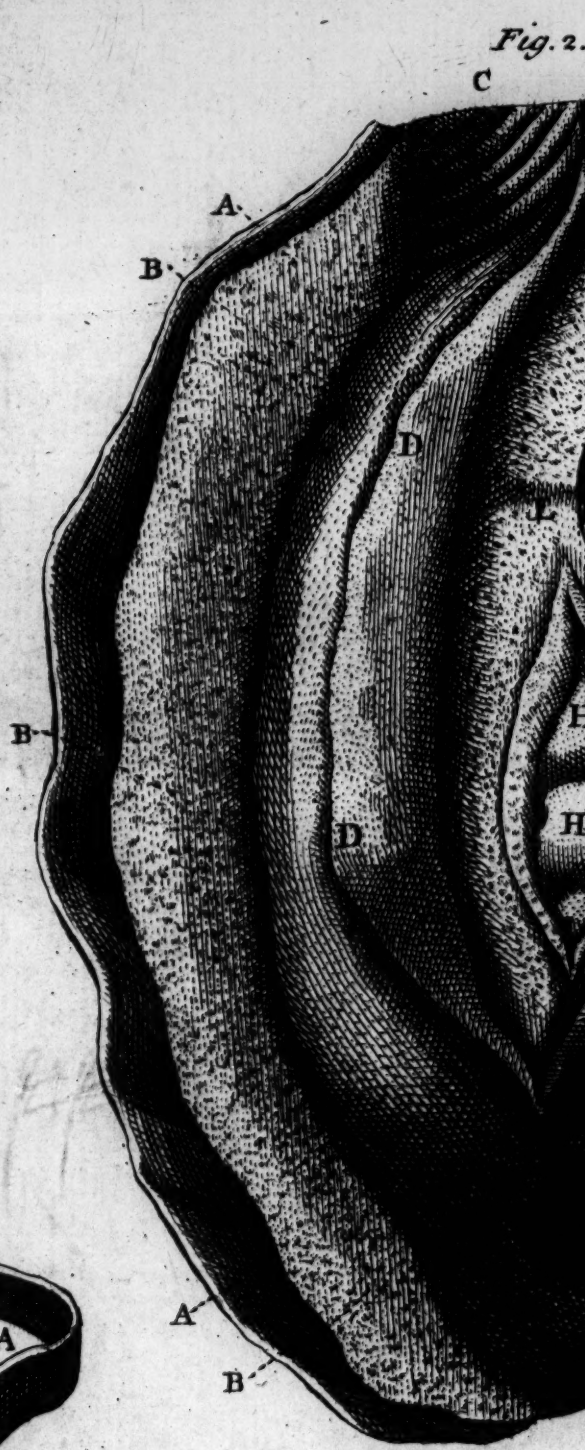
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Fig.7.
A

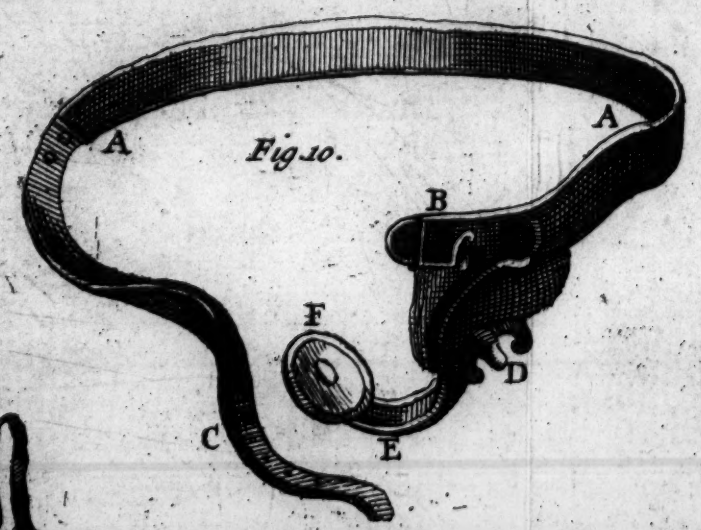
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Fig.10.
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C
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Fig.8.
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Fig. 2.

Fig. 5.

Fig. 3.

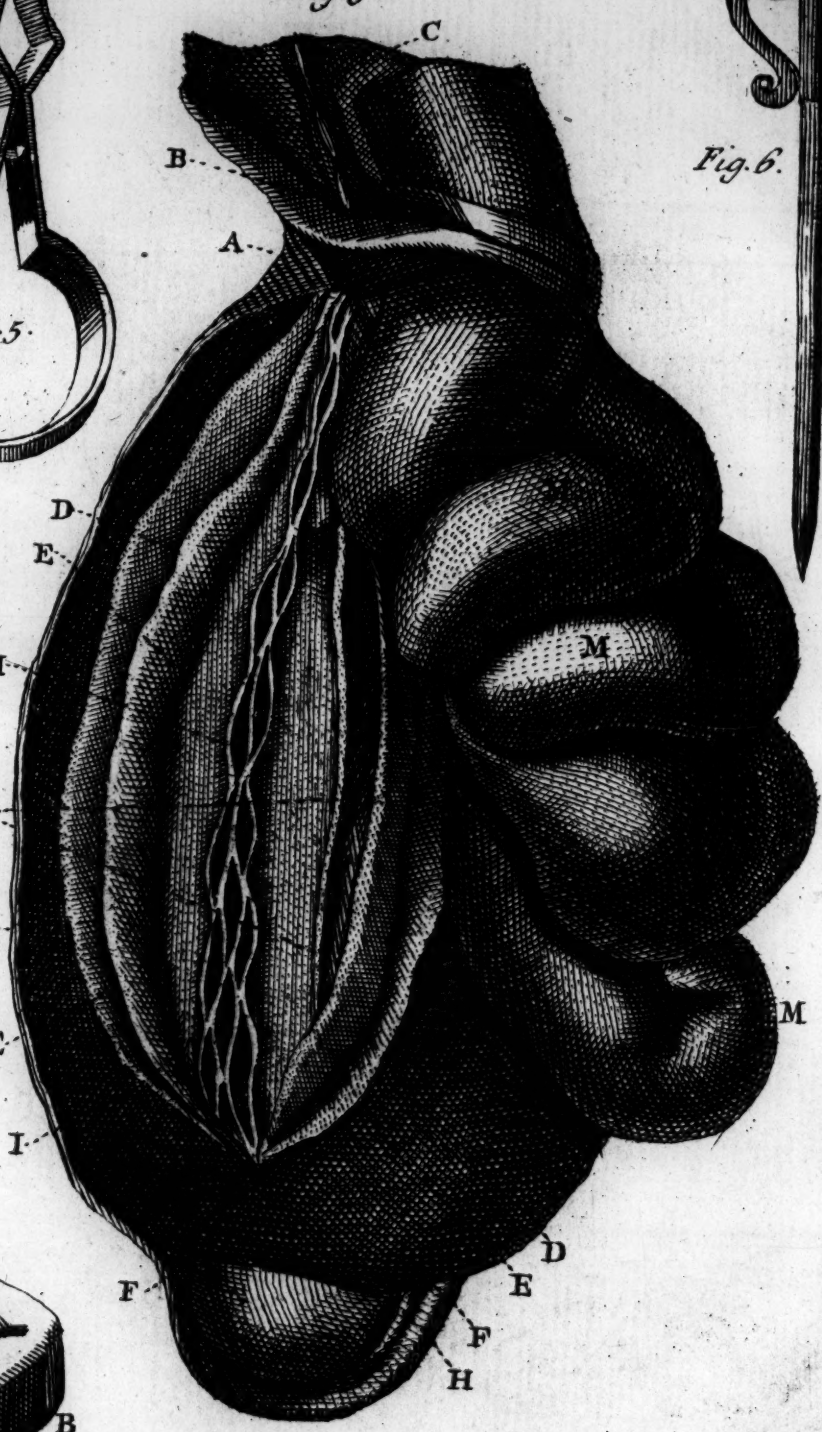


Fig. 6.

Fig. 9.

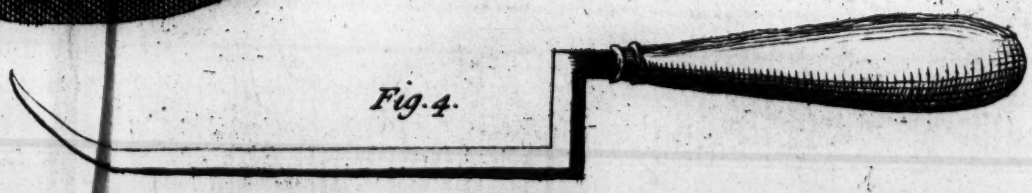


Fig. 4.

Fig. 8. Denotes a ſteel Yoke, made of two Arms AA, covered with Leather, deſigned to reſtrain an involuntary Flux of the Urine, by compreſſing the Penis and Urethra. B, the Hinge, by which the two Arms AA are joined. C, a Turn-ketch to open and ſhut the Inſtrument at Pleaſure. Taken out of NUCK's *Operat. Chirurg.*

Fig. 9. Is almoſt the ſame Inſtrument, a little improved, the Difference conſiſting chiefly in having a graduated Ketch c, whereby it may be contracted or enlarged at Pleaſure, according to the Size of the Penis. The reſt is explained by the Letters in the preceding Figure.

Fig. 10. Repreſents another Inſtrument for the Incontinency of Urine, taken from NUCK's *Operat. Chirurg. Fig.* 11. AA, the ſteel Girt or Belt to paſs round the Body; B, the Buckle, by which the leather Part c is faſtened; D, the Screw, by which it preſſes againſt, and raiſes the Plate E, whoſe Bolſter F, being defended with a Compreſs, is urged againſt the *Urethra in Perinæo.*

CHAP. CXXXVII.

Of introducing the CATHETER [a] *into the Bladder, in order to ſearch for the Stone, or diſcharge the Urine, when ſuppreſſed.*

Caſes in which the Catheter is neceſſary to be uſed.

I. THOUGH the paſſing of a Catheter into the Bladder may appear a ſlight and trivial Operation in the Eye of an inconſiderate Perſon; yet ſo arduous is ſometimes the Taſk, that it even baffles the Skill of the moſt expert Surgeon, and is through various Impediments impracticable, even in the dextrous Hand, which is frequently verſed in the Operation. There are uſually two principal Cauſes, for which this Inſtrument is applied in both Sexes. The firſt is, to be ſatisfied with regard to the Exiſtence of a Stone in the Bladder, in as much as the other Symptoms of the Stone, ſuch as Pain in the Bladder, Suppreſſion of the Urine, a Strangury or *Iſchuria*, *&c.* are often found to be fallacious, and not to be confided in; becauſe the ſame Symptoms may ariſe from an Inflammation, Abſceſs, or Ulcer in the Bladder, from a Tumor or Excreſcence in the Neck of the Bladder, *&c.* The ſecond Caſe, in which the Uſe of the Catheter is neceſſary, is to diſcharge the Urine in an *Iſchuria*, or when the Patient cannot make any Water at all, or but very little, and with difficulty, from ſome Defect in the Bladder, ſo that the Urine is thereby retained, until the Bladder is extremely diſtended, with violent Pain, and other bad Symptoms [b]. For if the Patient be not relieved in ſuch a Caſe, by a timely Appli-

[a] The Catheter (καθετὴρ *Galeno*, Lib. V. *Meth. Med.* Cap. V. and ÆGINETA, *Lib.* VI. *Cap.* LIX.) is deſcribed by the Ancients to be a long, hollow, and crooked Tube, uſed in Diſorders of the Bladder; and this Name was retained by the *Greeks*; but CELSUS (*Lib.* VII. *Cap.* XXVI.) calls it *Fiſtula ænea*, from the Metal of which it was compoſed.

[b] Thus HILDANUS takes Notice (*Cent.* II. *Obſ.* 65.) of a Patient, from whoſe Bladder were diſcharged ſix medical Pounds of Urine: But in another old Man the Bladder was diſtended almoſt up to the Navel, and the Abdomen ſo much enlarged thereby, that he reſembled a gravid Woman. PANAROLUS (*Pentecoſt.* I. *Obſ.* 27.) found near twenty Pounds of Urine in the Bladder of another Perſon, which was diſtended up to the Navel; and many more Inſtances may be ſeen in the Writers of Obſervations.

cation of this Inſtrument; the Neglect will certainly be attended with an Inflammation, Mortification, or Rupture of the Bladder, or Death will be the End, in the Extremities of Pain, Anguiſh, and Convulſions. But it ſhould be well obſerved, that the Catheter cannot be of Service in every Suppreſſion of Urine: For when that Excrement is not conveyed into the Bladder, through ſome Fault in the Kidneys, or Ureters; the Introduction of this Inſtrument muſt be evidently to no Purpoſe. Such a Caſe may perhaps receive more Benefit from the Hand of a Phyſician than a Surgeon. Nor is the Catheter to be precipitately introduced in every Retention of the Urine, before other more gentle Means have been tried; as when the Bladder has been over diſtended, by retaining the Urine too long, through Baſhfulneſs, from Cold, or any other Cauſe, in which the Patient feels a great Pain, and Tumour about the *Os Pubis*, the Tone and Contraction of the muſcular Coat of that Receptacle being thus deſtroyed, and its Neck cloſed with a ſpaſmodic Contraction: In theſe Caſes, the Uſe of the Catheter ſhould be poſtponed, until other more gentle Means have proved ineffectual; becauſe the Inſtrument cannot be conveyed through the curve Progreſs of the Urethra, without giving much Pain and Uneaſineſs to the Patient. In this Caſe, therefore, may be applied, eſpecially in Children, *Ol. Scorpionum vel Cappar.* which is eſteemed a Secret with FABRICIUS AB AQUAPENDENTE: But I have always found the moſt Succeſs from a Cataplaſm *ex Cepis aſſatis* applied to the *Regio Pubis*. Sometimes a gentle Preſſure of the Hand upon that part will be ſufficient to diſcharge the Urine, when it is retained from a Weakneſs or Relaxation of the Bladder. It may be alſo frequently diſcharged by Suction, with the Mouth, both in Infants and Adults. But when the Diſorder ariſes from a violent Inflammation in the Neck of the Bladder, there is often but little Service to be expected from introducing the Catheter; as the Inſtrument muſt meet with a very difficult Paſſage from the Conſtriction of the inflamed Parts, cauſing great Pain, and perhaps a Laceration or Contuſion of the tender Membranes and Veſſels by its Reſiſtance. Therefore, if this Inſtrument be uſed in ſuch a Caſe, the Surgeon will have cauſe to fear a conſequent Increaſe of the Inflammation, with Pain, Hæmorrhage, and poſſibly a Gangrene, Mortification, and Death: Whereas if the Patient is firſt bled, and the Inflammation abated by the Uſe of Gliſters, emollient Cataplaſms, *&c.* the Catheter may then be paſſed into the Bladder without much Difficulty. The Catheter may be therefore uſed (1) whenever the Urine cannot be diſcharged, from ſome Calculus obſtructing the Sphincter, or Neck of the Bladder: (2) When the Bladder cannot diſcharge its Contents from ſome natural Weakneſs, as is frequent in old People, and in Children, from ſome Violence in the Birth, or intenſe Cold [a], when topical Remedies take no Effect. (3) When the Urine has been too long retained through Baſhfulneſs, or any other Cauſe, whereby the muſcular Coat of the Bladder is ſo much diſtended, as to loſe its contractile Force, and become too weak to expel its Contents [b]. Of which Caſe the celebrated Aſtronomer TYCHO BRAHE is

[a] As is obſerved by AMATUS LUSITANUS, *Cent.* IV. *Curat.* 10. FORESTUS, *Lib.* XXV. *Obſ.* 18. and PECHLINUS, *Lib.* I. *Obſ.* 10.

[b] Examples may be ſeen in AMB. PAREY, *Book* XVI. *Chap.* 48. FORESTUS, *Lib.* XVI. *Obſ.* 25. and *Lib.* XXXV. *Obſ.* 3.

ſaid

ſaid to have deceaſed [a]. The Uſe of the Catheter is alſo not to be ſlighted (4) when the urinary Paſſages are obſtructed by ſome thick Mucus, concreted Blood, Matter, or putrid Membranes, which may be lodged in the Bladder, after a Wound or Ulcer in the Kidneys, or may ſtagnate in the Neck of the Bladder after making bloody Urine. And laſtly, it may be uſed (5) when the Urine is obſtructed in its Courſe, by ſome Caruncle, Tubercle, Abſceſs, or Cicatrix in the Urethra, near the Neck of the Bladder, being harder and larger than ordinary, or from an Inflammation, Scirrhus, or Abſceſs in the Proſtrate, or a Tumor thereof, from any other Cauſe, ſo as to obſtruct the Urine. However, as the Catheter can never be introduced, without giving a good deal of Pain and Uneaſineſs to the Patient, that ought always to be deferred, till more gentle Means have been found ineffectual.

Method of introducing the Catheter in Women.

II. But the Catheter may be introduced with much more Eaſe in Women than in Men; as the Urethra in the firſt is much ſhorter, wider, and in a ſtraighter Courſe. Though even in Women, the Inſtrument cannot be eaſily paſſed, by one that is not previouſly acquainted with the anatomical Structure and Situation of the Parts, particularly of the *Os externum Urethræ*, with regard to the reſt: For there are many ſmall *Foveæ*, *Lacunæ*, or Sinus's, at the Entrance of the *Vagina*, which may deceive the Surgeon. For the more ready finding the Orifice of the Urethra, the Surgeon is to obſerve, that it lies within the external *Labia*, in the upper Part of the Entrance of the *Vagina*, about a Finger's breadth below the *Clitoris*, as repreſented in *Tab.* XXIX. *Fig.* 2. D, where it will appear, upon diligent Inſpection, like a ſmall and hollow Cicatrix. To paſs the Catheter into the Bladder, the Woman ſhould be firſt laid in a ſupine Poſture upon a Bed or a Table, and after ſeparating the Thighs and external Labia from each other, which ſhould be held apart by the Hands of the Surgeon, or rather an Aſſiſtant, one of the ſilver Catheters [b] repreſented in *Tab.* XXVII. *Fig.* 1. and 2. is to be ſlowly and carefully paſſed through the *Meatus urinarius* into the Bladder: The Size of the Catheter may be about the Thickneſs of a ſmall Gooſe Quill, and its End ſhould be firſt dipt in Oil [c]. The Inſtrument being rightly paſſed, the Wire marked A, is then to be drawn out of the Tube, and the Urine by that Means diſcharged through the Apertures B, ſuppoſing the Inſtrument to be uſed for diſcharging the Contents of the Bladder; but if the Catheter is paſſed into the Bladder to ſearch for the Stone, it is to be gently turned about, from one Side to the other, in all Directions, attending diligently to obſerve if any Sound is emitted, by ſtriking the Catheter againſt the Calculus: If ſo, there is Reaſon enough to believe the Exiſtence of a Stone in the Bladder; but if only a Reſiſtence be felt without any Sound, it may poſſibly be a Scirrhus or other Tumor. With regard to the Catheter itſelf, ſuch are moſt approved of for Women, as are ſtraight, or but very little inflected, as that in *Tab.* XXVII. *Fig.* 1. but I do not think that very material, ſince thoſe, which are much longer, and more inflected, may be uſed almoſt with equal Advantage; I mean ſuch as

[a] By HILDANUS, *Lib. de Lithotom. Cap.* III. and more at large by GASSENDUS, *in Vita ejus*, L. V. *p.* 178.

[b] The Catheter was formerly made of Braſs or Copper, but the Moderns make it of Silver well poliſhed, as the *Arabians* did. *V.* ALBUCASIS, *Lib. Cap.* 58.

[c] When I have been at a Loſs for ſuch an Inſtrument in the Country, I having often uſed a ſmall Gooſe Quill in its Stead, for diſcharging the Urine.

are intended for Men, *Tab.* XXVII. *Fig.* 2, 3, 4, and 5. When the Urine has been thus diſcharged, the Cure is often compleated, but not always; for when there is expected a ſpeedy Return of the Complaint, the Catheter is to be left in the Urethra, or elſe introduced again, till the Bladder has recovered its proper Tone or Strength to diſcharge its own Contents of itſelf. It is therefore moſt adviſeable to paſs the Catheter without any delay, when there is a Suppreſſion of Urine in Women, who have a difficult Labour, leſt their Delivery ſhould be ſo ſlow and tedious, as to diſtend and weaken the Coats, till they become paralytic, or the Nerves relaxed, ſo as to render the Diſorder ever afterwards incurable.

Method of paſſing the Catheter in Men.

III. To paſs the Catheter into the Bladder of a Male, is a Taſk much more difficult, than to paſs it in a Female Subject; becauſe in the firſt the Urethra is ſo long, narrow, and variouſly inflected, that it may well puzzle a Surgeon, who is unacquainted with the anatomical Structure of the Parts (repreſented in *Tab.* XXIX. *Fig.* 1. EDDD) and the proper Artifices which are uſed by other Surgeons in the Operation, having alſo never before made trial upon dead Subjects. Though this Operation is much better ſhewn by Example, than deſcribed by Words, we ſhall for the Sake of Beginners endeavour to explain it in the beſt Manner we are able. In the firſt Place, it will be neceſſary for the Surgeon to have a Set of Catheters of various Sizes, to ſuit different Patients; four at leaſt (tho' CELSUS (*Lib.* VII. *Cap.* 26.) thinks three of a moderate Size will be ſufficient) of different Lengths, Diameters, and Curvatures, as in *Tab.* XXVII. *Fig.* 2, 3, 4, 5. *Fig.* 2. is for a Lad of about ſix Years old. *Fig.* 3. for one of twelve Years. *Fig.* 4. for a young Man of about ſixteen. And *Fig.* 5. for thoſe who are more adult. The longeſt ſhould be, according to CELSUS, fifteen Fingers breadth, and the ſhorteſt nine Fingers breadth long, which may be a very ſufficient Proportion for the Undertaking, the intermediate ones being in proportion. Some approve of their being very ſmall, or ſlender, thinking that thereby they have a more eaſy Paſſage into the Bladder, in which they are much miſtaken; becauſe the moſt ſlender ones are apt rather to catch and ſtick in the *Rugæ* and Inequalities of the *Urethra*, which often appear very conſiderable in old Men, ſo that the whole Operation may be thereby fruſtrated. This is confirmed with two Examples by HILDANUS [a], in which neither himſelf nor the Lithotomiſt could paſs a very ſlender Catheter into the Bladder; but upon introducing a larger, about the Size of a Gooſe Quill, they found a ready Admittance: The ſame is alſo confirmed by Dr. RAW, and by my own Experience. Thoſe are the beſt Catheters, which are made of poliſhed Silver, having their Curvatures in a certain Proportion, being charged with a ſilver Wire AAA, to prevent them from bending in the Operation; to perform which, the Male Patient is to be laid on his Back upon a Bed or Table, and the Surgeon ſtanding on the right Side, takes hold of the Penis with his left Hand, and elevates it, while with his right Hand he takes a Catheter ſizable to the Patient, by the Handle C, and dipping the End of it in Oil, proceeds to apply it with the convex Part towards the Abdomen, as in *Tab.* XXIX. *Fig.* 3. gently thruſting it forward, till he has reached the Bottom of the *Os Pubis*. That done, he then gradually turns the Catheter by its

[a] *Cent.* II. *Obſ.* 65. *Cent.* IV. *Obſ.* 65.

Handle

Handle from the left Hand towards the Abdomen with a certain Dexterity [a], ſo that the concave Part of the Catheter is now towards the Abdomen, as in *Fig.* 4. Then the End of the Catheter B, is gently preſſed downward under the *Os Pubis*, and then upward into the Bladder, and by drawing out the Wire, the Urine enters by the Apertures BB, and flows out through the Tube. In this Manner the Catheter may be alſo introduced, when the Patient is ſtanding, or ſits inclined in a Chair. The Catheter may alſo be eaſily paſſed into the Bladder, if the Patient be laid on a Bed, and the Surgeon ſtanding on his left Side, elevates the Penis, and a little inclines it towards the Navel, and then applies the Catheter with its concave Part towards the Abdomen, protruding it into the Urethra down to the *Os Pubis*, and ſo thruſting it under the Symphiſis of thoſe Bones without the artificial Turn, moving the Catheter in the Urethra, ſomewhat in a circular Poſition; and this is a Method much eaſier to be practiſed with Succeſs by thoſe, who are not verſed in the Operation, than the preceding. But in either of theſe Methods the Surgeon ſhould proceed with Prudence and Gentleneſs, leſt by too great Violence he ſhould lacerate the Urethra, and thereby excite violent Pains, profuſe Hæmorrhage, dangerous Inflammation, and perhaps Death itſelf; for I have known all theſe ill Conſequences brought on by an unſkilful Treatment in this Caſe. Sometimes the Patient is perfectly freed from his Complaint by the firſt Diſcharge of the Urine by the Catheter; at other Times, it will be neceſſary to repeat the Operation at certain Intervals, when the Urine cannot be voided by the Patient without: For the Cauſe of a Retention of the Urine is not always to be removed by the Catheter, only the moſt grievous Symptoms, which it occaſions, are hereby relieved, for the preſent; ſuch as violent Inflammation and Diſtention of the Bladder, Caruncles, Tumor of the Proſtrate, *&c.* Thus the End of the Catheter often cannot paſs into the Bladder, from an Inflammation in its Neck; but after abating the Inflammation by bleeding, and proper Medicines, the Catheter may then be paſſed into the Bladder, which it could not before. If the Urine does not diſcharge itſelf by the Catheter, as ſoon as introduced, which ſometimes happens, in that Caſe, it ſhould be aſſiſted by gently compreſſing the Abdomen with the Hands, by rubbing it, or by Suction, by either of which Aſſiſtances the Urine will often follow. If in paſſing the Catheter, the End of it ſhould meet with ſome Obſtruction from the natural Caruncle of the proſtrated Gland, which is termed by Anatomiſts *Caput Gallinaginis*, the Catheter ſhould not then be forcibly thruſt forward, ſo as to injure any of the Parts, but it ſhould rather be drawn a little back, and then gently protruded again, by which Means it will often paſs over the Obſtacle, and enter the Bladder. If a Caruncle from a venereal Cauſe ſhould obſtruct the Paſſage of the Catheter in the Urethra, that indeed may be forcibly broke through by the End of the Catheter.

IV. If the Catheter be paſſed into the Bladder to ſearch for the Stone, the End of it ſhould then be carefully directed to all Parts, as we before obſerved; and if, at the ſame Time that the Inſtrument meets with a conſiderable Reſiſtance, you obſerve a Noiſe, from the meeting of the two Bodies, there is no Room to doubt of the Exiſtence of a Stone in the Bladder: But if that Sign

Method of ſearching for the Stone.

[a] The *French* call it *le tour de Maitre*, or the maſterly Turn; becauſe it is not eaſily performed by thoſe who are not expert in it.

cannot

cannot be found by the Surgeon, he may therefore reaſonably conclude, that there is no Stone, or at leaſt much doubt of its Exiſtence in the Bladder. If a hard and ſonorous Body ſhould have been once touched by the Catheter, after long ſearching, and the ſame cannot be eaſily met with again, it is a Sign, that the Stone is either very ſmall, or lies concealed in ſome ſmall Cavity or Cell of the Bladder, as may be obſerved in *Tab.* XXIX. *Fig.* 1. and 2. Whereas, if the Catheter immediately and conſtantly ſtrikes againſt a hard and ſonorous Body, it is a Sign the Calculus is very large. If the Catheter ſlides eaſily over the Surface of the Calculus from one Side to the other, it is a Sign of a ſmooth Stone; but if the Patient has ſometimes bloody Urine, and the Catheter moves over the Stone with a conſiderable Reſiſtence, it denotes the Calculus to have a rough or uneven Surface, or, as CELSUS (*Lib.* VIII. *Cap.* 26. *N°* 2.) terms it, *Superficies ſpinoſa.* And laſtly, if the hard Body is not eaſily moved by the Catheter, and affords a clear or briſk Sound, it is reaſonable to ſuppoſe the Calculus to be of the larger and more compact Kind; whereas, if it appears to have no great Weight by the Catheter, and yields a dead or flat Sound, the Patient's Urine being alſo fabulous, it is then probable, as CELSUS obſerves, that the Calculus is of a more ſoft and loſe Texture. Which Obſervations are both confirmed by Experience, and the Authority of the celebrated Lithotomiſt of *Leyden*, JAC. DENYS, in his *Obſ. Chirurg. de Calculo.*

Uſe of the flexible Catheter.

V. But to prevent a Renewal of the excruciating Pain to the Patient, and trouble to the Surgeon, from repeating the Operation of paſſing the Catheter, when the Retention of Urine will follow again in a ſhort Time, either from a Contraction of the Neck of the Bladder, or from ſucceſſive Obſtructions with a Calculus, *&c.* in that Caſe, our modern Surgeons have provided a kind of flexible Catheter, made of flatted ſilver Wire, convoluted in a particular Manner, as in *Tab.* XXVII. *Fig.* 6. to give a continual Paſſage to the Urine. This Inſtrument may be left in the Parts for many Days together, without incurring any Damage to the Patient, if it be properly ſecured or faſtened, until there is no longer any Neceſſity for its reſiding there. But as the flexible Catheter is uſually much more difficult to paſs into the Bladder than the other; it will be generally neceſſary for the Surgeon to paſs a common or rigid Catheter through the Urethra firſt, and let it reſide there ſome Time, in order to open and dilate the Paſſage, through which the flexible Catheter is afterwards to enter into the Bladder, which ſhould be done immediately after the Extraction of the other Catheter, to prevent the Parts from collapſing again. HELMONT [a] rejects Catheters made of Silver or Copper, as too ſtubborn for the tender Parts they are to enter, and therefore deviſes another, to be made of Leather, ſewed together in the ſame Form; for which Invention he much applauds himſelf, as he thinks little or no Pain will attend the Uſe of this laſt, from its Softneſs. But this, in my Opinion, ſeems to demonſtrate how little that famous Gentleman was converſant in chirurgical Operations; for the very Advantage, which he propoſes, *viz.* the ſoftneſs of the Inſtrument, renders it uſeleſs in the Hand of a Surgeon, as it will not thereby be able to make its way into the Bladder. FABRICIUS *ab Aquapendente* alſo informs us, that he had uſed a flexible Catheter, which he had made him of Horn; and others have

[a] *Lib. de Lithiaſi, Cap.* 3. *No.* 34.

been

been made of other Subſtances: But thoſe made of Silver are at preſent in univerſal Uſe and Eſteem with the moſt expert Surgeons, as they have not only a ſufficient Strength and Reſiſtance, but will take an exceeding fine poliſh, and better receive and retain the proper Figure or Form, that is given to them, whereby they may be eaſily paſſed into the Bladder.

VI. Some Surgeons [a] think it beſt to have many Apertures in the curve Part of the Catheter, the better to facilitate the Exit of the Urine; but two, near the Extremity of this Inſtrument, are very ſufficient, and will generally diſcharge the Urine in a very conſiderable Stream: More Apertures would probably render the Uſe of this Inſtrument not ſo ſafe and practicable, eſpecially when the *Corpus ſpongioſum Urethræ* is diſtended with Blood, whereby ſome part of it may be preſſed into the Apertures, ſo as to wound the Parts, and obſtruct the Progreſs of the Inſtrument. For this Reaſon, the celebrated PETIT has recommended Catheters of another Make, without any Apertures in the Sides, as in *Tab.* XXVII. *Fig.* 7. which, though cried up, and greatly applauded, for a new Invention, by GARENGEOT [b], was long before delineated by DE LA CHAMP [c]; though he directs it for removing Caruncles of the Urethra. In this Inſtrument the Aperture is at the Extremity A, *Fig.* 7. which is ſhut by a pyriform Button, marked B. When this kind of Catheter is paſſed into the Bladder, the Handle of the Wire C, is preſſed inward, by which Means the Button marked B, is thruſt out of the Tube, as is repreſented at D, in the next Figure; and thus a Paſſage is given to the Urine. To conclude, the Catheter may be alſo of uſe to inject various Liquors into the Bladder, in ſeveral Diſorders, when the Tube of this Inſtrument is faſtened to a Syringe or common Bladder, from whence the Injection is to be forced; which has been remarked by ÆGINETA, *Lib.* VI. *Cap.* 59. An Abſceſs in the Neck of the Bladder, cauſing a Retention of the Urine, has been ſometimes broke by paſſing the Catheter, and the Suppreſſion thereby removed. A particular Diſſertation on this Operation, intituled *De Catheteriſmo*, has been publiſhed here, at *Helmſtat*, by MERIBOMIUS, *Ann.* 1699.

CHAP. CXXXVIII.

Of CARUNCLES *in the* URETHRA.

I. MEN, who have formerly had a Gonorrhea, or an Ulceration of the Urethra, frequently meet with extreme Difficulty in voiding their Urine, ſo that it cannot be diſcharged without great Pain, and Straining, ſo as to flow in a ſmall Stream like a Thread, being ſometimes alſo totally obſtructed or ſuppreſſed. This Diſorder has been attributed by the Phyſicians of preceding Ages to a Caruncle, or fleſhy Excreſcence, in the Cavity of the Urethra, till of late BRUNNER, a celebrated Phyſician to the Elector Palatine, and DIONIS, in his Surgery, rejecting the ancient Opinion, have deduced it, perhaps with more Reaſon, from a Cicatrix, rather than a Caruncle, remaining

[a] As NUCK in *Experim. Chirurg. p.* 124. and SOLINGEN, in *Chirurg.* Tab. VIII.
[b] *Lib. de Inſt. Chirurg. Tom.* I. *p.* 267.
[c] In *Chirurg. p.* 322.

after

after the Cure of an Ulcer in this Part, which has been occaſioned by a Gonorrhea. Their Opinion is confirmed to be true, in many Inſtances, of Bodies that have been opened after Death, labouring under this Complaint. Though in many Caſes alledged by ARNEAU and PETIT, the Cauſe of this Diſorder has been neither a Caruncle nor Cicatrix, but a Tumor formed in the ſpongy or cavernous Body of the Urethra itſelf (in the ſame Manner as the Membranes of the Noſe are tumified in a Coryza) ſo as to occlude the Paſſage of that Canal. However, the Experience of one Party may be oppoſed by the other in this Diſorder, they may perhaps both be in the right, as the very ſame Diſeaſe may proceed from different Cauſes. Though we find BENEVOLUS, a celebrated *Italian* Phyſician of *Florence*, yet diſſenting from both theſe Opinions. He declares, in an expreſs Treatiſe on the Subject, that he has always found the Cauſe of this Diſorder to be a Tumor or Ulceration, and Enlargement of the natural Tubercle, in the Proſtrate, called by Anatomiſts *Caput Gallinaginis*; but that he could never yet find the Urine obſtructed, in this Complaint, from a Caruncle in the Cavity of the Urethra. He always obſerved the Obſtruction to be more or leſs, in Proportion to the Quantity of Matter lodged in the *Caput Gallinaginis*. He ſays, the Diſorder almoſt conſtantly follows a virulent Gonorrhea, and that both its beginning and latter End are accompanied with diſcharges of purulent Matter and Fibres with the Urine. For my own Part, I muſt acknowledge there may be Truth on the Side of each of theſe Gentlemen, though I am not for confining the Diſorder to one particular Cauſe. But which ever Cauſe, or Opinion, takes Place in this Complaint, it is no great Matter; ſince the Method of Cure is one and the ſame in all. The Surgeon may reaſonably determine, whether it proceeds from a Caruncle, by the Patient's Relation, and Symptoms of the Diſorder: For, in that Caſe, the Obſtruction is not ſo ſudden, but the Urine flows in a ſmall Stream, and gradually leſſens, till it is totally ſuppreſſed; the Patient is alſo continually endeavouring to void his Urine, from the Irritation of the foreign Body in the Urethra. Sometimes a ſlight Fever attends the Complaint. But the Seat of the Obſtacle in the Urethra may be nearly determined by paſſing a Catheter, leaden Probe, or Wax-candle, into that Canal: For wherever the Inſtrument meets with more than ordinary Reſiſtance, there may be reaſonably conjectured to be the Seat of the Complaint. Laſtly, as this Diſorder is often attended with moſt violent Pain and Anguiſh from the extreme Difficulty of voiding the Urine, ſo as often to hazard, and ſometimes totally deſtroy the Life of the Patient; the Surgeon ſhould be therefore well acquainted with the Methods of relieving one thus afflicted.

Method of removing ſlight Caruncles.

II. If the Diſorder be of no long ſtanding, and there appears to be no great Stricture in the Urethra, the Surgeon may then ſucceed, without much Difficulty, by the following Practice. The Patient being ſeated on a Couch or his Bed, the Surgeon holds the Penis with his left Hand, while with his right he introduces a Probe of Lead or Wax-candle (of about a Foot long, and Thickneſs of an ordinary, or rather a large Catheter, which has been firſt dipt in Oil) into the Urethra, until he has arrived at the Obſtacle, and paſſed a little beyond it: This being ſecured by proper Bandage from falling out, is to remain there for ſome Days, till by compreſſing the Obſtacle the Urethra appears to be pervious, as uſual, or the recent Diſorder at leaſt much checked in its Progreſs.

Progreſs. The leaden Probe, or Wax-candle, is to be extracted every Time the Patient wants to diſcharge his Urine, and then to be introduced and ſecured again in the preceding Manner, in which it is to be continued, until the Complaint is entirely removed. But if the Diſorder be ſo obſtinate, or inveterate, as not to yield to the preceding Method, it will then be neceſſary, according to the general Practice, to dreſs the End of the leaden Probe or wax Candle with *Vitriolum R. Alum. uſt.* or *Præcipit. rub. cum. Ung. fuſc. vel Ægyptiac.* to be paſſed into the Urethra to touch the Obſtacle. This, according to the general Advice, ſhould be repeated two or three Times in a Day, till the ſuperfluous and morbid Excreſcence is corroded and removed by the Applications, and a free Paſſage thereby made for the Urine. Concerning the Succeſs of which Practice we are furniſhed with various Inſtances. But BRUNNER and BENEVOLUS, who will not allow the Diſorder to ariſe from any Caruncles, or fleſhy Excreſcences in the Urethra, condemn this Practice, as pernicious, and apt to corrode or ulcerate the Urethra: Nor do I myſelf approve of it, when there is no Caruncle or Obſtacle in the Urethra, but only in ſuch of thoſe Caſes, as will not yield to the milder Practice firſt mentioned. But it may be here neceſſary to obſerve, that the Patient ſhould always diſcharge his Urine, before the leaden Probe or wax Candle be paſſed into the Urethra, that it may remain there the longer without Extraction, and ſo more effectually compreſs or dilate the Parts. And even when a free Paſſage has been this way obtained for the Urine, it may be neceſſary to retain a Tent or Inſtrument of the like Kind a few Weeks, or at Intervals, in the Urethra, that the Parts lately made pervious, may remain ſo more effectually and ſecurely. Laſtly, BENEVOLUS adviſes to arm the End of the Probe with a Piece of *Emplaſt. Diapalmæ*, that it may more diſtend and heal the morbid or ulcerated Part of the Urethra than the reſt; but I think that Intention may be anſwered much better, as I have indeed often experienced, by injecting *Aq. Calc. vel Plantag. cum pauco Sacch. Saturni, vel Lapid. medicamentoſ. Crollii*, which are found extremely ſerviceable in cleanſing and ſiccatrizing Ulcerations in general.

Treatment of the more obſtinate Caruncles.

III. When the Paſſage of the Urethra is entirely blocked up in this Diſorder, ſo that no Urine can be evacuated, it will then be neceſſary, if there is no great Inflammation, to ſeek for Relief from the Catheter. If the Inſtrument meets the Stricture or Obſtacle in the Urethra, it ſhould be ſtrongly, but cautiouſly, preſſed, by twiſting it through the ſame, to break or divide the Caruncle or Cicatrix, and dilate the Parts for a more free Paſſage: And after drawing off the Urine, a leaden Probe or Wax-candle dipt in Oil, may be introduced and retained in the Urethra, as before, to keep it pervious. But if either the Catheter cannot be paſſed, becauſe of the violent Inflammation and Pain, or the Urethra can be by no Means opened, ſo that the Patient's Life is in the utmoſt Danger, the laſt and moſt ſevere Remedy left, is, to make an Apertion or Paracenteſis of the Bladder with the Trocar, either *in Perinæo* or above the *Os Pubis*, in that part of the Abdomen, where the high Operation is performed for the Stone, which we ſhall quickly explain at large. The Patient's Life being ſecured by the Bladder thus opened, and Urine diſcharged by the Cannula, left in the Bladder; the Surgeon next proceeds to treat the Diſorder in the Urethra by the Methods before propoſed, until he has rendered the Urethra pervious, and obtained a free and natural Paſſage for the Urine;

after which, the Cannula of the Trocar may be extracted, and the Wound healed.

Inflammation of the Urethra, how to be treated.

IV. If the Retention of Urine ſhould proceed from an Inflammation of the Urethra, and that in a violent Degree, the Surgeon ſhould not then introduce either the Catheter, Probe, or Wax-candle, becauſe either of them will greatly increaſe the Inflammation, and conſequently the Diſorder: He ſhould rather bleed the Patient largely, and ply him with diſcutient Medicines, both internally and externally; particularly the Parts affected, ſhould be treated with diſcutient Fomentations and Cataplaſms, in order to abate the Inflammation and Tumor; and then the Urethra may be compreſſed, and a Paſſage made by retaining a wax Candle, leaden Probe, or the Catheter, for ſeveral Days in the Urethra. But when the Inflammation of the Urethra is ſlight, the Urine may be immediately drawn off by the Catheter, without any farther Apparatus.

Some neceſſary Obſervations.

V. It is a neceſſary Caution, with regard to the Wax-candle, which is to dilate and open the Urethra, that it be not protruded too far, or thruſt into the Bladder itſelf: For in that Caſe, ſome part of the Wax may be ſeparated, and ſtay behind in the Bladder, where it will form the Baſis of a future Calculus or Stone. When the Difficulty of diſcharging the Urine proceeds from ſome Diſorder in the Bladder itſelf, as an Excreſcence, Abſceſs, Ulcer, an Induration or Calloſity of its Neck, or in the Proſtrate, it is but ſeldom that the Patient can find any Relief from the Hand either of the Phyſician or Surgeon: For the leaden Probe, Wax-candle, or uſe of corroding Medicines, are here not only uſeleſs, but pernicious. On the contrary, when the Urine is obſtructed by ſome Tumor, Ulcer, or Cicatrix in the Urethra only, the beſt Method of relieving the Patient will be by the leaden Probe or Wax-candle dipt in Oil. Though a Cicatrix in the Urethra is more difficult to be removed this way, than a Tumor or Ulcer, but we are at preſent unacquainted with better Means of dilating and opening the Urethra; and that this Method will often ſucceed very well, even in a Cicatrix, is confirmed by Experience, as well as the Authority of BENEVOLUS.

CHAP. CXXXIX.

The Method of extracting a CALCULUS *in the* URETHRA.

The Method without cutting.

I. IN Patients ſubject to the Gravel, or ſabulous Concretions, we often meet with a Calculus or ſmall Stone, obſtructing the Urethra, ſo as to deny any Paſſage to the Urine, and often exciting the moſt excruciating Pains, as well as occaſioning a total Suppreſſion of the Urine. This is a deplorable Caſe for the Patient, to relieve which, the Phyſician or Surgeon ſhould endeavour to extract the Calculus without delay. The Seat of the Calculus in the Urethra is various, being ſometimes at its beginning, in the Sphincter or Neck of the Bladder, behind the *Scrotum*, *in Perinæo*; and ſometimes in the Middle of the Urethra, or elſe near its Extremity in the *Glans Penis*: Sometimes, again the Calculus is included in a particular kind of Sacculus or Expanſion of the Urethra, which has been obſerved by LE DRAN (*Tom.* II. *Obſ.* 79.) and DENYS (*Obſ. Chir. p.* 144.) mentions a like Caſe. In the Year 1737 I alſo found

found two *Calculi* contained in this kind of Sacculus at the Bottom of the Urethra before the Scrotum, from whence I cut them out: Which is indeed an extraordinary Caſe, and the two Calculi I have repreſented in *Tab.* XXVII. *Fig.* 16, 17. But the particular Part of the Urethra, in which the Calculus is lodged, may be known without much Difficulty, from the Seat of the Pain, by feeling, and by probing with an Inſtrument. As the Seat of this Diſorder is various, ſo alſo is the Method of treating it. It may, in the firſt Place, be proper to try the Efficacy of Diuretics internally, with the Uſe of Fomentations, Cataplaſms, Gliſters, and bathing externally, continued for ſome Time: But if they prove inſufficient, a Quantity of Oil of Olives or ſweet Almonds may be injected into the Urethra, to lubricate its Surface, together with that of the Calculus, and facilitate its Diſcharge; to promote which, the Patient may alſo ſit in a Semicupium or Bath, made with emollient Herbs. Some make a Ligature upon the Penis, behind the Calculus, and by ſtrongly inflating the fore Part of the Urethra, they dilate it, ſo as to make way for the Calculus to come forwards, and be diſcharged: Which Practice is by PROSP. ALPINUS [a] ſaid to be very common and familiar with the *Ægyptians*.

The cure by cutting.

II. If the Calculus reſiſts all thoſe Means, and the Suppreſſion of Urine, with the other Symptoms, increaſe, it will then be neceſſary to try a more ſevere, but effectual Means for its removal by the Knife. If the Calculus is perceived to lodge in the Neck of the Bladder, it may be extracted by a *Section in Perinæo*, where the Stone is perceived by the Touch; but if the Patient will not ſubmit to the Operation, the Calculus may for the preſent be puſhed back by a Catheter into the Bladder; though the Operation, in my Opinion, is much preferable, becauſe the Stone will otherwiſe grow much larger in the Bladder, and ſubject the Patient to greater and perpetual Diſorders. If the Stone ſhould ſtick ſo faſt, that the Catheter cannot eaſily repel it; or if the Surgeon, for the foremention Reaſon, is unwilling ſo to do; it may be extracted by Inciſion, or the Operation for Lithotomy termed *Apparatus minor*, deſcribed in the following Chapter; *viz.* by inſerting one Finger into the Anus, to hold the Calculus firm in its Place, and making an Inciſion upon it, large enough for its Extraction. If the Calculus is lodged near the Glans, the beſt Method will be to inject Oil into the Urethra, after the external Applications before-mentioned have been applied ſome Time to the Part: And thus by relaxing, lubricating, and gently preſſing with the Fingers, to which we may add Suction, in Infants, the Calculus may be often happily diſcharged, without running the Hazard of a Wound, Cicatrix, and Fiſtula in the Urethra, from the Operation [b]. If the Calculus ſtops near the external Orifice of the Urethra, it may be then extracted by a Hook, a Pair of Pliers, or an Ear-pick. See *Tab.* VI. *Fig.* 14. But if thoſe Inſtruments prove inſufficient, it may be proper to try that deſcribed and recommended by MARINUS for the ſame Purpoſe, as in *Tab.* XXIX. *Fig.* 7. *viz.* the Part or Eye marked A, is to be cautiouſly protruded into the Urethra beyond the Calculus, ſo as to intercept or catch it; after which, it is to be drawn out together with the Calculus, by the Handle B. If through the

[a] *In Medicina Ægyptiorum*, Lib. III. Cap XIV.

[b] Inſtances of Stones extracted by theſe Means, may be ſeen in V. HORN's *Microtec.* and TULPIUS, *Obſ.* 8. *Lib.* III. An Example of a Calculus extracted by Pliers, ſee in SCULTETUS, *Obſ.* 63.

Violence of the Inflammation, or Largeneſs of the Stone, all theſe Means prove ineffectual; there is then no other Method of relieving the Patient, but by the Operation, as TULPIUS and GARENGEOT alſo affirm. The Extremity of the Urethra in the Glans is therefore to be divided with a Pair of Sciſſors, and the Calculus puſhed out, by introducing a Probe or ſmall Hook; and then the Parts wounded are to be waſhed with Wine, and dreſſed with ſome vulnerary Balſam.

When the Calculus is in the Middle of the Urethra.

III. When all the Means now cited prove without Succeſs, as they frequently do, when the Calculus lies in the Middle of the Urethra; there is then no other way left to ſave the Patient, and relieve him from his Diſorder, than by opening the Urethra, by making an Inciſion through it with the Scalpell upon the Body of the Calculus, enlarging it ſufficiently upward and downward for the Extraction of the Calculus. More particularly, thus: The Skin of the Penis is to be drawn tenſe, either forwards, as CELSUS [a] adviſes, or backwards, according to WILDMANNUS [b], and the Glans being either covered with, or denudated of its Præpuce, a Ligature is made upon the Penis behind the Calculus; leſt by the Preſſure of the Surgeon's Hands it ſhould be forced farther into the Urethra. The Surgeon then preſſes his left Thumb upon the Calculus, that it may neither ſlip backward nor forward, while with his right Hand he makes a longitudinal Inciſion on one Side of the Urethra, large enough to extract the Calculus, either with his Fingers, or Inſtruments, *viz.* a Pair of Pliers, Probe, or Hook. After the Stone is extracted, the Skin of the Penis is let looſe, and the Wound dreſſed with ſome vulnerary Balſam, a Plaſter, *&c.* If the Inciſion be very long, it is adviſeable to inſert a leaden Cannula or Tube into the Urethra beyond the Wound, to receive and diſcharge the Urine, that it may not paſs through the Wound, whoſe Agglutination and Cure would be very much retarded by the Acrimony of the excrementitious Liquor, and poſſibly degenerate into a callous Ulcer. The Wound may be alſo preſerved from the Urine, by directing the Patient to drink but very little, a few Days before and after the Operation. The Inciſion is directed to be made laterally, becauſe the Wound in that Poſition is not ſo apt to receive Injury from the Urine in its Paſſage, as it would, if it had been made in the Bottom of the Urethra. It would have been dangerous to have directed the Inciſion in the upper Part of the Penis, becauſe then the *Corpora Cavernoſa* muſt have been wounded, the Conſequence of which might be a fatal Hæmorrhage, or other malignant Symptoms. ALBUCASIS, one of the beſt *Arabian* Phyſicians, adviſes to break the Stone when it ſticks in the Urethra, by boring it with an Inſtrument, which he delineates, when it cannot be preſſed out by the Fingers; alſo PAREY, and others, propoſe the ſame Inſtrument: But ſuch an Inſtrument can hardly be uſed without greatly injuring the Urethra in boring the Calculus. If ſuch an Inſtrument ſhould not ſucceed, ALBUCASIS then adviſes to make a Ligature upon the Penis on each Side the Calculus, that it may not move either backward or forward, after which it is to be extracted by Inciſion [c].

THIBAUT's Method.

IV. We have already explained the uſual Method of dividing the Urethra by Inciſion, for extracting the Calculus; it now remains for us to deſcribe a

[a] *Lib.* VII. *Cap.* 26. [b] In *Lib. German. de Lithotomia,* Pag. 58. and 39. [c] *Vide Opera ejus,* Part II. Cap. 61.

new

new Method, invented by a celebrated Surgeon of *Paris*, named THIBAUT, and deſcribed by GARENGEGT. It is briefly this: He holds the Penis in his left Hand, and makes an Inciſion firſt laterally through the Skin, and then above through the Urethra, which is firſt freed from the *Corpora Cavernoſa Penis* by a Scalpell. The Urethra is divided by a longitudinal Inciſion upon the Calculus, under the *Corpora Cavernoſa*: And after extracting the Stone by a Hook or Pliers, the Wound is dreſſed up with ſome Balſam, ſcraped Lint, Compreſs, and Bandage. Thus they aſſert, the Wound in the Urethra will heal much ſooner, as being covered with the *Corpora Cavernoſa Penis*.

V. When theſe Calculi are included in a particular kind of Sacculus, I think the beſt Method is to make a lateral Inciſion in the Part moſt convenient for their Extraction: And thus I took out the two Calculi before-mentioned, N° 1. figured in *Tab.* XXVII. *Fig.* 16. and 17. by making an Inciſion ſufficiently large. I then treated the Cavity of the Sacculus firſt with digeſtive Ointments, and then with corroding Medicines, ſuch as *Merc. præcipit. rub.* and ſometimes, even *Lapis Infernalis*, compleating the Cure with *Balſ. Capiv. & Emplaſt. agglutinant.* But a Wound in this Part is not eaſily to be healed, as may be learned from the 79th *Obſ.* of LE DRAN, where almoſt every Artifice was uſed in vain. When the Stone is included in a Sacculus.

CHAP. CXL.

Of Lithotomy, *or cutting for the Stone in Males, particularly by the old Method, termed* Apparatus Minor; *where we ſhall alſo propoſe ſomething concerning* Nephrotomy.

I. LIthotomy, or cutting for the Stone, ſometimes called *Cyſotomy*, from the *Greek*, Κύϛις, *Veſica*, is an artificial Opening or Inciſion made into the Bladder, for the Extraction of ſome offenſive concreted or indurated Body; but when the Stone is cut out of the Kidney, which very rarely happens, the Operation is then termed *Nephrotomy*, which we ſhall alſo preſently conſider in this Chapter [a]. This Operation is rendered neceſſary, becauſe there is no other Method, that we are yet acquainted with, of extracting a Calculus, when it is too large for the Urethra; cauſing extreme Pain, Inflammation, Ulceration, and a Strangury, or a total Suppreſſion of the Urine, followed with Convulſions, and ſometimes a miſerable Death. I am ſenſible, that many Phyſicians, and others, will have it poſſible to diſſolve, break, or otherwiſe diminiſh and expel the Stone in the Bladder by internal Medicines, and I myſelf have given a remarkable Inſtance, in favour of this Opinion, in the *Philoſ. Tranſact.* N° 417. *p.* 13. the greateſt Part of the Fragments of which Stones I have now by me: But we have never yet been ſo happy, as to find a Medicine that will

[a] Though the Bladder and Kidneys are more ſubject to calculous Concretions than other Parts, yet we are aſſured by Experience, and the many Inſtances cited by the medical Writers of Obſervations, that Stones have been found in all the other Parts of the Body, of which we have a large Number of Examples collected and publiſhed by CRELLIUS, in a Pamphlet, intituled, *Marmorea memoria Seligmanni. Lipſiæ*, 1708. But I think they ſhould be always extirpated, when practicable, as they excite Pain, and other bad Symptoms.

certainly

certainly diſſolve the Stone in all Patients, in any reaſonable Time; and the Succeſs attributed to ſome famous Noſtrums has been frequently owing more to Chance, or other particular Incidents, than the Medicine itſelf. Nor am I ſenſible of any other certain Method of relieving the Patient from a large Stone, than by the Operation: And if ſuch a Diſſolvent was known, there is no doubt but the Rich and Great, who are well diſpoſed, would be at any Expence for ſo general a Good, an Inſtance of which we have had lately, though without its good Effect. Nor do I know, that the *Ægyptian* Method of inflating the Urethra to diſcharge the Stone in the Bladder, was ever tried with Succeſs in *Europe*, as ſome [a] would fain perſuade us it may. But for the Operation of Lithotomy itſelf, it is ſo difficult and dangerous, that it has been with Reaſon ordained among the Ancients to be the entire Profeſſion of one Phyſician, free from other Studies and Practice, that he might be the more expert in this Art [b]. For if the Structure of the Bladder, and its true Diſpoſition with regard to the adjacent Parts, be not firſt well known, and the Surgeon expert in the Enchireſis, or neceſſary Artifices to be uſed for cutting, and in extracting the Stone; it is very poſſible, that the Patient may through ſuch Defect loſe his Life in the Operation.

Origin of the Stone.

II. We are aſſured from Experience, that Children are more ſubject to the Stone than Adults; and that the Children of poor People have it oftner than thoſe of the Rich: Becauſe thoſe of the poor eat more plentifully, and of a groſſer Food, which is not ſo eaſily digeſted; whence the Blood is filled with a groſſer Chyle, whoſe Parts will be more apt to run into Coheſions in all the ſecretory Veſſels, and particularly thoſe of the Kidneys, whence the Stone in the Bladder. For the firſt Rudiments of a Calculus are generally ſome previous Obſtruction, ſabulous Concretion, or an Inflammation in the Kidneys. But as to the long Train of Cauſes, to which many of the Moderns attribute the Origin of the Stone in the Bladder, ſuch as living too much upon Cheeſe, plentiful drinking of Rheniſh Wine, *&c.* they are either too remote to be well known, or too uncertain for the Phyſician to have any Dependence thereon. The Stone then, is uſually firſt formed of a very few Particles in the Kidney, which ſliding through the Ureter into the Bladder, attract ſimilar Particles from the Urine retained there, until it at laſt advances to the Weight of many Ounces, and ſometimes to ſeveral Pounds [c], changing the Name of Gravel for that of the Stone in the Bladder. For while the Concrete remains in the Kidney, it is termed the Gravel or Stone in the Kidney; which, when it is of a very conſiderable Size, can be removed by no Means whatever, unleſs it ſhould occaſion an Abſceſs in the Loins; which being opened, either naturally, or by the Scalpell, the Stone may be then extricated, otherwiſe there is no way to remove it but by Nephrotomy: Whereas, there are ſeveral Methods for extracting the Stone in the Bladder by Lithotomy, when it is not of an extraordinary Size. Sometimes there is but one Stone in the Bladder, and ſometimes

[a] Proſper Alpinus, in particular, in his *Medicina Ægypt.* p. 104.

[b] See the Oath of Hippocrates and Celsus, *Lib.* VII. *Cap.* 26. Æginета, *Lib.* III. *Cap.* 45. *Lib.* VI. *Cap.* 60.

[c] Inſtances of which may be ſeen in Greanfield's Treatiſe of the Stone and Gravel, Denys, Crellius, and others.

more,

more, to above twenty, thirty, or forty [a]. Some Stones of the Bladder are ſmooth and poliſhed, others are rough and ſharp pointed: Some are ſoft and friable, like Mortar; others are very hard and ſolid, like Pebbles or Flint.

III. Before the Surgeon proceeds to the Operation, he ſhould be well ſatiſfied of the real Exiſtence of a Stone in the Bladder; becauſe the very ſame Symptoms are often occaſioned from ſome other Cauſe, as a Tumor, Inflammation, Abſceſs, or Ulcer in the Bladder, or its Neck: And it would be both cruel and imprudent to ſubject the Patient to ſo ſevere and dangerous an Operation, without abſolute Neceſſity: To perform the Operation on a Patient, who has no Stone, would be to ſhew his own Ignorance, or an Intention to deceive the Patient. To be aſſured therefore of the Stone in the Bladder, the Surgeon ſhould attend to the following Signs: *Viz.* the Patient uſually feels a Pain, Heat, and Itching in that part of the Bladder where the Stone is lodged; it is with great Pain and Difficulty, if at all, that he can diſcharge his Urine; which is generally pale, turbid, and of a bad Smell, parting with a mucous Sediment at the Bottom of the Veſſel, and ſometimes accompanied with a purulent Matter, or with Blood, when the Stone is rough and ſharp pointed. To theſe we may add, that an uneaſy Senſation and Itching is felt by the Patient in all the Parts betwixt the *Perinæum* and Extremity of the *Glans Penis:* Upon which account, Boys afflicted with the Stone, are continually pulling their Præpuce, as it gives a little Eaſe to their Pain, ſo that their Penis becomes by that Means extended much longer than uſual. But all the Signs now mentioned are both uncertain and inconſtant, as all of them may ariſe equally from an Inflammation, Abſceſs, Ulcer, or Scirrhoſity in the Neck of the Bladder or the proſtrate Gland, as alſo from too great Acrimony in the Urine, and other Cauſes. There is a ready Method of diſcovering the Stone, more certain than any of the preceding, uſed formerly by the ancient Phyſicians, and at preſent by itinerant Lithotomiſts: Which is by introducing one or two Fingers into the Anus of the Patient, ſtanding or lying down, preſſing the other Hand againſt the Abdomen, immediately above the *Os Pubis*, by which Means the Bladder and its contained Stone may be plainly felt by the Fingers *in Ano*, from the Weight and Hardneſs of which, they certainly conclude that there is a Stone in the Bladder. But even this Method, though it be not contemptible, is by no Means to be relied upon as infallible; becauſe we find by Experience, that the Surgeon may be this way deceived, by miſtaking a ſcirrous, callous, or other Tumor in the Bladder, Rectum, or Proſtrate, inſtead of a Stone, which appears to the Finger, in this Method of ſearching, much in the ſame Manner. There is therefore no other certain and infallible Method of being aſſured that there is a Stone in the Bladder, than that of ſearching with the Catheter; the Method of paſſing which Inſtrument through the Urethra into the Bladder, for this Purpoſe, we have before deſcribed in *Chap.* CXXXVII. For the Hardneſs or Reſiſtance, and Colliſion or Sound, afforded by the meeting of the two Bodies, are a certain Proof, not only of the Exiſtence of a Stone, but alſo a pretty ſure Mark of its Size, Solidity, and Diſpoſition of its Surface. If the Catheter immediately hits upon it, and conſtantly touches it, it is a Sign of a large Stone; whereas if it be ſome Time

Signs of the Stone in the Bladder.

[a] As in GREANFIELD and RUYSCH, *Obſ.* 1. *p.* 2. in both which Caſes there were extracted forty two Stones.

before

before you can touch the Calculus with the Catheter, and do not eaſily meet with it again, it is a Sign of Smallneſs. However, we are obliged to confeſs, that even the Signs afforded by the Catheter, are ſometimes liable to deceive us in forming a Judgment concerning the Stone in the Bladder. For (1) the Hardneſs or Reſiſtance ſometimes perceived by this Inſtrument, is not from a Stone, but ſome Excreſcence, Tumor, or Induration, in part of the Bladder itſelf. And then (2) a ſmall Stone may be concealed from the Catheter in ſome Receſs or Cell in the Bladder (ſee *Tab.* XXXI. *Fig.* 1, 2.) ſo that it cannot be well touched. And laſtly (3) there are Caſes, which frequently occur, where the Catheter cannot be paſſed into the Bladder, being prevented by the Inflammation, or ſome other Accident; ſo that the Surgeon is obliged to ſearch by introducing his Finger *in Ano*, by which Means the Size of the foreign Body may be alſo pretty well diſcovered.

Prognoſis. IV. When we are aſſured by the Signs now mentioned, that there is a Stone in the Bladder, ſo large, that it will not paſs through the Urethra, but fatigues the Patient with the moſt grievous Symptoms [a]; there is then but one certain, though a ſevere Method of removing the Diſorder; *viz.* by the Operation of Lithotomy, all internal Means being either uſeleſs or uncertain. If the Severity of the Diſeaſe therefore brings the Patient to a Reſolution to undergo the Operation it ſhould be a Matter of the laſt Importance with a prudent Surgeon, to be previouſly ſatisfied, with regard to the Probability of his Succeſs or Miſcarriage in the Operation, from the various Circumſtances of the Caſe, leſt he ſhould meet with unexpected Death inſtead of a promiſed Recovery. For notwithſtanding we at preſent poſſeſs many Advantages over our Anceſtors in this Operation, by new Improvements in Inſtruments, and the Methods of uſing them; the Operation of Lithotomy is ſtill very dangerous, though the Patient does not run ſo great a Hazard of his Life, when of a good Habit, as formerly. We may obſerve, that it is a great Diſadvantage to the Patient to have a Stone that is very large, and rough ſurfaced, or ſharp pointed. Such is the Size, ſometimes, of the Stone in the Bladder, that we are aſſured, by many Inſtances, that it could by no Means be extracted in the Operation [b]. A Stone of a moderate, or even a large Size, with a ſmooth Surface, may be extracted with a great deal more Eaſe, than one that is very ſmall, as it is a Difficulty to lay hold of the laſt. The Stone in the Bladder is uſually larger or ſmaller, in proportion as it has continued there a longer or ſhorter Time: Increaſing gradually, by ſmall and rough Grains of ſaline and earthy Matter, or by ſmooth Lamellæ, or Coats, over each other, like an Onion. Such therefore do not conſult the Advantage of themſelves, or others, who endeavour to delay and put off the Operation, eſpecially when the Stone appears already to be ſufficiently large: For by ſuch Delays the Stone enlarges, ſo as to render the Operation much more dangerous and difficult. When a Patient has been worn out by the Stone, or ſome other Diſorder, then alſo the

[a] If the Patient be not troubled with any violent Symptoms from the Stone, he may by palliating Medicines, often retain it as long as he lives, without much Injury, as may be ſeen in Rousſetus, Widelii *Diſſ. de Lithot. & Ephem. Nat. Cur. Cent.* IX. *Obſ* 2.

[b] Thus the celebrated Archiater and Profeſſor Borichius died in the Operation, becauſe the Stone could not be extracted, it was ſo large. See his Life in *Conſpect. Scriptor. Chemic.*

Operation

Operation is not very likely to ſucceed: The Patient may perhaps die in the Operation. Laſtly, the more Strength and better Habit the Patient has, and the ſmoother-ſurfaced, and more moderate ſized are Stones, though ſeveral in Number; the greater Proſpect there is of a ready and happy Cure by the Operation.

Prerequiſites to the Operation.

V. When the Operation is therefore reſolved upon, after duly weighing all the forementioned Circumſtances; there are then three Things neceſſary to be conſidered by the prudent Surgeon: *Viz.* (1) what is to be done before the Operation is undertaken or begun, (2) what is neceſſary to be done in the Operation itſelf; and laſtly, (3) what after the Operation is concluded. Before the Operation is begun, he ſhould judiciouſly determine (1) which of the Methods is to be uſed, as there are ſeveral; and (2) fix a convenient Time for the Operation, before which he ſhould (3) prepare the Patient by a proper Regimen, or Medicines; and (4) he muſt provide the neceſſary Apparatus of Inſtruments; and laſtly (5) he is to diſpoſe and ſecure the Patient in a proper Poſture for his Work.

The ſeveral Methods of Lithotomy diſtinguiſhed

VI. Firſt, with regard to the Method of operating to be choſen by the Surgeon, it is to be obſerved, that there are chiefly four Ways of performing Lithotomy, for the Stone in the Bladder. The firſt and moſt ancient is, from the few Inſtruments employed, diſtinguiſhed by the Title of *Apparatus Minor:* And as this Method has been received and approved of by CELSUS, and GUIDO CAULIACO; it is by ſome denominated *Methodus Celſiana, vel Guidoniana.* The ſecond Method of Lithotomy is, from the Number of Inſtruments uſed therein, termed *Apparatus Magnus*, or MARIANUS's Method. If we reſpect the Date of them, the firſt is by ſome termed the *Old*, and the ſecond the *new Method*; as having been contrived within theſe two Centuries: Whereas the old Method has been extant for above two thouſand Years. The third Method of performing Lithotomy is termed *Apparatus altus*, or, more ſeldom, *Sectio Hypogaſtrica:* Wherein the Inciſion is made in the lower Part of the Abdomen, in the anterior Side of the Bladder, immediately above the *Os Pubis*; whereas in all the other Methods, the Inciſion is made *in perinæo*, betwixt the *Anus* and *Scrotum.* This third Method is alſo, by ſome, denominated *Franconica*, from PETER FRANCUS, who practiſing it on an emergent Occaſion, is ſaid to be the firſt Author of it, though he afterwards diſſuaded from the Uſe of it. The fourth and laſt Method of cutting for the Stone, which is alſo the moſt Modern, having been invented towards the End of the laſt Century, is termed the *lateral Operation*, or *Methodus fratris Jacobi*, as being invented by a *French* Monk named FRERE JAQUES, who firſt practiſed it with ſurprizing Succeſs, and great Applauſe: It is alſo (but ſeldom) termed RAVINUS's *Method.* We ſhall treat of each of theſe Methods in their diſtinct Chapters following, but I have not had Opportunity of experiencing all of them in my own Practice.

The Time convenient for performing Lithotomy.

VII. We before obſerved that a convenient Time ſhould be fixed for performing the Operation of Lithotomy; which may vary according to Choice or Neceſſity. It is to be obſerved, that the Operation may be performed at any Seaſon of the Year with us in *Germany:* For in the Summer time the Air is more temperate or leſs hot than in other Countries, and in Winter, the Coldneſs of the Air may be removed and moderated at Pleaſure by our Stoves.

Though it muſt be confeſſed that Spring and Autumn ſeem to be more favourable for the Operation than other Seaſons: So that when there is no urgent Neceſſity, the Caſe may be deferred until then; but it would be baſe in a Surgeon to neglect the Patient on this account, when there is a real Neceſſity for his performing the Operation before, the Patient being all the while tormented, and perhaps loſt, for want of Help, of which we have had many Inſtances.

Method of preparing the Patient.

VIII. With regard to the Method of preparing the Patient for the Operation, he ſhould be directed to live on a ſpare Diet for ſeveral Days; and if he be an Adult, of a full Habit, he ſhould be bled, which may be omitted in Boys; though in both, the Body is to be kept open with laxative Medicines. The Evening before the Operation, or the Morning of the ſame Day, a purging Glyſter ſhould be adminiſtered to the Patient; that he may not foul and obſcure the Surgeon's work with his Fæces, which are generally diſcharged in cutting. On the contrary, if the Patient be weak, and low, he ſhould be ſupported by a nouriſhing Diet, and proper Medicines: And three or four Hours before the Operation, it may not be amiſs to give him, according to the *French* Cuſtom, ſome ſtrong Broth, or a Couple of Eggs poached ſoft, to be drank in ſome Wine; or if he be a Child one Egg may ſuffice. And laſtly, it may be proper to ſhave off the Hair, if there is any, in *perinæo*.

The Apparatus of Inſtruments and Dreſſing.

IX. The Apparatus of Inſtruments, Bandage, and Dreſſing, for the Operation of Lithotomy, varies according to the ſeveral particular Methods of performing it; each of which we ſhall deſcribe in their proper Places: But here we ſhall only conſider what is neceſſary for the *Apparatus Minor*. Such as the particular kind of Biſtory or Scalpel, exhibited in *Tab.* XXVII. *Fig.* 8. or a Razor inſtead of it, which, together with the Hook (*Fig.* 10.) or a Pair of Plyers, will be ſufficient for the Purpoſe. For the Dreſſing, the T Bandage ſhould be had in readineſs, to be applied in the Manner repreſented in *Tab.* XXXVIII. *Fig.* 16. to this may be added a thick and ſquare Compreſs, of about four Fingers breadth, ſome ſcraped Lint and ſtyptic Powder, or rather highly rectified *Sp. Vini*, which is much better for ſtopping the bleeding, when more exceſſive than the other: On the ſame Account it may be alſo neceſſary to have ſome crooked Needles and Thread, in Readineſs for taking up the larger Veſſels, which may happen to be divided.

Poſture of the Patient.

X. We have endeavoured to repreſent the moſt proper Poſture, for the Patient to be ſecured in for this Operation, when an Adult in *Tab.* XXIX. *Fig.* 5. and ſhall try to explain it more particularly hereafter: But to be prolix on this Head, in the old Method of Lithotomy by the *Apparatus Minor*, which is never practiſed on Adults, but by Mountebanks and Pretenders, would be uſeleſs and unneceſſary. But if a Child is to be cut for the Stone by this Method, he is to be tied in the Poſture before repreſented, or ſecured in the ſame Manner by two Aſſiſtants, the ſtrongeſt of which ſhould be ſeated on a high Chair, holding upon his Knees a Pillow or Cuſhion, covered with a Linen Cloth three or four Times double, hanging over his Knees down to his Feet. Upon this Pillow the young Patient is to be ſeated, and ſecured, as we have repreſented in *Tab.* XXVIII. *Fig.* 1. from Tolet. The Lad thus placed, if he be ſtrong, another Aſſiſtant may hold his Arms, ſo that he cannot move: Or if he be of a luſty Stature, or fourteen Years of Age, he may then be placed

placed in the Poſture before repreſented in *Tab.* XXIX. *Fig.* 5. which is the ſeventh Table of TOLET.

The old Method of Lithotomy, by the *Apparatus Minor*, deſcribed.

XI. The Lad being thus moſt commodiouſly placed, the Surgeon then proceeds to perform the Operation; which in the old Method of Lithotomy by the *Apparatus Minor*, is done in the following Manner. Firſt, the Surgeon dips the Fore-finger of his left Hand in Oil, and then introduces it into the *Anus* of the Patient, rightly diſpoſed and prepared, preſſing it forwards towards the *Os Pubis*; while with his right Hand he preſſes backward upon the lowerPart of the Abdomen, on the Bladder, immediately above the *Os Pubis*, and having felt the Stone, he thruſts it to the left Side of the *Perinæum* near the *Anus*, and there holds it with his Fingers in ſuch a Manner that it forms a viſible Tumor in *Perinæo*. (See *Tab.* XXIX. *Fig.* 3. A) This done, he makes an Inciſion upon the moſt prominent Part of the Tumor *in Perinæo*, with the Scalpel or Biſtory held in his right Hand, cutting down ſucceſſively through the Integuments upon the Calculus, and enlarging the Wound longitudinally, he at laſt divides the Bladder itſelf, in the ſame Direction, (BB) ſufficient for the Extraction of the Stone. It is neceſſary that the intervening Parts betwixt the Knife and Calculus be cleanly divided, without leaving any Adheſions, leſt the Extraction of the Stone ſhould be by that Means hindered, as it otherwiſe would be, eſpecially when a rough one: As alſo to avoid giving the Patient more than neceſſary Pain, and prevent a conſequent Inflammation, from lacerating and contuſing the nervous Parts. The Bladder thus divided, and the Knife laid aſide, or given to the Aſſiſtants, if the Stone be ſmall it may be thruſt out at the Wound by the Fingers *in Ano*; or if it be large and rough, its Extraction may be effected, partly by the Preſſure of the Fingers in *Ano*, and partly by applying the Hook B. See *Fig.* 6. *Tab.* XXIX. But if the Stone ſhould ſlide back again into the Bladder, or ſtick faſt in the Wound, it may be then drawn out by the Forceps.

What is to be done after the Operetion.

XII. When the Stone has been thus extracted, it will be neceſſary to introduce the Finger, a Catheter, or Probe into the Bladder (*Tab.* XXVII. *Fig.* 11.) in order to make a diligent Search, whether there are any other of thoſe Concretions yet remaining in that Receptacle. For it is very frequent to find other Stones in the Bladder, when that extracted is of a ſmooth and poliſhed Surface, or when the Stone is broke in the Extraction. If there be any remaining they ſhould be therefore carefully extracted by the Fingers, a Hook, Forceps, or Pliers, for this Purpoſe; and when all is found clear, the Operation is concluded, and the Patient put to Bed. But for the ſubſequent Dreſſing, Regimen, and future Treatment of the Wound; they may be managed according to the Directions we ſhall give in explaining the modern Method of Lithotomy, by the *Apparatus Magnus*, in the next Chapter.

Our Judgment on this Method

XIII. It is to be obſerved that this ancient Method of Lithotomy, which we have been now explaining, being very ſimple in itſelf, is chiefly practiſed by Mountebanks and ignorant Operators; being quite laid aſide by all our modern and ſkilful Phyſicians and Surgeons, who have more dexterous and ſucceſsful Methods of cutting. However, I think this Method very well practicable in Boys under fourteen Years of Age, which is the Time limited by CELSUS and ALBUCASIS for this way of operating; becauſe in them there is no great Difficulty in bringing the Stone to its proper Place *in Perinæo*:

And the Simplicity of the Method is rather a Recommendation than a Diſparagement of it to us; eſpecially as it has been ſo long practiſed, with very good Succeſs, in young Subjects, not only for many Ages paſt by our Anceſtors, but alſo by ſeveral, in our modern or preſent Practice: For it has certainly this Advantage over the *Apparatus Magnus* of MARIANUS, and the *lateral Operation* of RAVINUS and JAMES, that it can be performed with the feweſt Inſtruments, and often with nothing more than the Knife: In this way too the Urethra is not injured by paſſing the Catheter, nor the Bladder pinched by the Uſe of Forceps or Plyers; the Stone is alſo readily found, and more eaſily and ſpeedily extracted than in the Operation of MARINUS, and the lateral Method of Lithotomy, in which the Stone ſometimes cannot be found by the moſt expert Maſters. To which we may add, that in this way the Stone ſerves as a Guide and Foundation for the Surgeon to cut upon; and was what gave Birth to the lateral Operation now in vogue. For CELSUS tells us (*Lib.* VII. *Cap.* 26.) that the Wound is to be made in the Integuments near the Anus, down to the Neck of the Bladder: And ALBUCASIS ſays the Stone is to be protruded to the Bottom of the *Os Iſchium*, where the Inciſion is to be afterwards made. I have therefore practiſed this Method of operating, with Succeſs, on young Subjects for many Years paſt; and at Times ſtill continue to do the ſame now: Alſo the experienced MARINUS would perſuade us ſtill to uſe this Method in Children, upon many Accounts, in his *Italian* Treatiſe of the principal Operations in Surgery. This Operation is alſo moſt eligible in ſome Caſes for Adults, as when the Urine is ſuppreſſed by a Calculus ſticking in the Neck of the Bladder, where it may be perceived, forming a Tumor *in Perinæo*, and can be neither diſcharged by Medicines, nor ſafely repelled by the Catheter. (See *Chap.* CXXXIX. preceding.) It may be alſo allowed of in ſome other Caſes, where the Stone gravitates towards the *Perinæum*, forming a Tumor, in which it may be ſenſibly perceived: Otherwiſe, the *Apparatus Minor* is allowed, even by CELSUS and ALBUCASIS, its ancient Patrons, to be not without Danger in Adults.

Concerning Nephrotomy.

XIV. Laſtly, as there are many Caſes in which a Stone in the Kidney can by no Means be diſſolved or removed by Medicines, and the Patient being continually in the moſt extreme Torture, is deſirous by any Means to be freed; it may not be inconſiſtent with our Deſign in this Place, to reſolve the Queſtion, whether a Stone in the Kidney may not be cut out in ſuch a Caſe; which is a Subject ſeldom treated of in Books of Surgery. The generality of thoſe who have ſaid any Thing upon the Subject in their Writings, think it a Propoſal too dangerous to be practicable, and therefore treat it with Neglect; when at the ſame Time there are extant many Arguments, both from Reaſon and Experience, which recommend ſuch a Practice to be abſolutely neceſſary, eſpecially under particular Circumſtances. For we have many Inſtances of Patients who have been freed from the Stone in the Kidney, by a Wound in that Part, received accidentally in the Back [a]; and that in ſome Caſes without any dangerous Symptoms. Among other Inſtances which have come under my own Obſervation, I ſhall only mention a late one, of a Man who was wounded by another with a Knife, upon the Region of the right Kidney, in his Back, in the Year 1735, in ſuch

[a] Many of which are collected by WEDELIUS *in Diſſertat. de Lithotomia, Jenæ* 1714. See alſo SCHENCK *Obſervat.* and BOHN *de vuln. lethal.* p. 157.

a Man-

a Manner that Blood, and bloody Urine, was voided in great Plenty for ſeveral Days through the Wound, and through the Urethra ; but after he was tranſmitted to my Care at *Helmſtadt*, he was happily cured within the Space of four Weeks. It is therefore moſt certain, that Wounds of the Kidneys are not always mortal, as ſome have imagined, but frequently curable ; eſpecially thoſe inflicted on the Back, without penetrating into the Cavity of the Abdomen. And HIPPOCRATES [a], though he interdicts his Pupils from performing the Operation of Lithotomy, does yet direct them, in treating of Diſorders in the Kidneys, *to make an Opening where they are elevated and tumified, that after extracting the Gravel, and diſcharging the Matter, they may be healed with Diuretics. For by ſuch an Opening or Inciſion there may be hopes of a Recovery ; otherwiſe the Patient is a dead Subject.* And in the ſame Book (*Cap.* XVI. *tit.* 8.) he ſays. *When there is a Suppuration of the Kidney, and it forms a Tumor near the Spine ; in that Caſe a deep Inciſion is to be made upon the Tumor near the Kidney, or* (as he ſays in another Place, *Cap.* XVIII. *tit.* 17.) *into the Kidney itſelf.* From whence it appears, that making an Inciſion in this Part is not ſo greatly to be feared. ROSSETUS alſo, the accurate Anatomiſt RIOLAN, and others, are induced, by many Reaſons, to think that Nephrotomy may be often practiſed with Succeſs ; if the Inciſion be made in that part where the Calculus is perceptible, taking care to avoid wounding the emulgent Artery, Vein, or the Ureter, and to prevent the Wound from penetrating into the Cavity of the Abdomen. But nothing can be more reaſonable than to perform Nephrotomy, when we are directed to it by Nature, pointing out the Place, by a Tumor and Abſceſs formed in the Loins, from a Calculus in the Pelvis or Kidney. In ſuch a Caſe, we are alſo ſupported by the Advice and Authority of SCHENCKIUS, WEDELIUS, and MEEKREN ; together with LAVATERUS, formerly an eminent Phyſician and Surgeon of *Helvetia*, with whom I amicably cohabited for ſome Time, in the Year 1710, he then practiſing Surgery at *London*, with great Applauſe. He at that Time told me that he had not only performed this Operation with Succeſs in the above-mentioned Caſe, but had alſo publickly declared (in the laſt Page but one of a Treatiſe publiſhed in the Year 1708, at *Utrecht* on the Rhine, *de Atriteis & Hypoſſpadiceis*) that " I performed the Operation of Nephrotomy, on either of the " Kidneys, when Nature directs to that Practice, by forming an Abſceſs." There is therefore no apparent Reaſon why this Operation ſhould be condemned, under the forementioned Circumſtances, as it is by a great many ; I ſhould rather adviſe, according to my own Practice, never to omit Nephrotomy, when Nature thus points out the Road to it, ſince the Life of the Patient may be frequently not only this way preſerved, but alſo freed from the Torture and excruciating Pains excited by the Calculus, which may be thus freely extracted by the Fingers, a Hook, or a Pair of Plyers. For more on this Subject conſult FONTANUS, *exempl.* 42. *fol.* 117. HILDANUS, *Cent.* VI. *Obſ.* 44. TULPIUS, *Lib.* IV. *Obſ.* 28.

[a] *Lib. de Intern. Affect.* Cap. XV. Tit. 19.

CHAP.

CHAP. CXLI.

Of Lithotomy *by the* Apparatus Major.

The Reaſon of its Invention.

I. FROM the preceding Account of Lithotomy by the *Apparatus Minor*, it appears to be practicable with Eaſe and Expedition in Infants; but there are many Caſes, eſpecially in Adults, as MARIANUS and HILDANUS have rightly obſerved, where that Method would be both dangerous in its Conſequences and difficult in the Performance. For when the Stone is unequal and rough-ſurfaced, which is often the Caſe, the Patient is not only tortured with extreme Pain by forcing it to the Side of the *Perinæum* in the Operation; but the Roughneſs of it will alſo frequently occaſion a violent Inflammation and conſequent Gangrene: The inequality of the Stone alſo frequently cauſes the Inciſion upon it to be ſo uneven as to render its Extraction thereby difficult; ſo that many bad Conſequences muſt neceſſarily follow. To which may be added, that the Surgeon is ſometimes liable to wound the Rectum, or perforate it with his Finger [a], whence it will be very difficult to ſuſtain and feel the Stone, ſo as to cut upon it. If the Patient alſo be large and corpulent, the Magnitude of the Bladder and its Diſtance from the Anus may render it difficult to protrude the Stone to the Side of the *Perinæum*; and it will be ſtill much more difficult to retain it firm in that Situation, becauſe of the Slipperineſs of the Bladder and Rectum: To which if we add the Smoothneſs of the Stone's Surface, and the aptneſs of the Surgeon's Finger to be cramped, or to be tired, and incapable of holding out, it will evidently appear that this Method of Lithotomy muſt be in many Caſes both hazardous and impracticable. Not to inſiſt upon the Poſſibility and Danger of wounding one of the *veſiculæ Seminales*, on the left Side, ſo as to impare in a great Meaſure the Patient's ſufficiency for Procreation. Theſe and other Inconveniences, eſpecially that the *Apparatus Minor* is only practicable in Infants, has induced the Surgeons of the ſixteenth Century, about the Year 1520, to invent another Method of cutting for the Stone, with new Inſtruments; which was then, and has ſince continued to be practiſed with great Succeſs: Inſomuch that the moſt expert Surgeons, eſpecially thoſe of *France*, have generally preferred it to the more ſimple and ancient Method, by the *Apparatus Minor*; except, as we before intimated, when the Calculus is lodged in the *Perinæum*, or ſticks faſt in the Neck of the Bladder or poſterior part of the Urethra, ſo that it can neither be repelled back again, nor diſcharged forward. The Invention of this new Method of Lithotomy by the *Apparatus Major*, is aſcribed to a celebrated *Italian* Phyſician of *Cremona*, *Franciſcus de Romanis*, *vel Romano*: Whoſe Method was afterwards improved and publiſhed by one of his Scholars, MARIANUS SANCTUS, in a Treatiſe of a barbarous Stile *de Lapide veſicæ per inciſionem extrahendo*. Venet. 8^vo^. 1535. and afterwards at *Paris*, 4^to^. 1540. Since when it has been denominated, from its improver and firſt deſcriber, MARIANUS's *Method of Lithotomy*, and from the larger Number of Inſtruments uſed in it, the *Apparatus Magnus*, or *Major*: But of late, ſince we have had other Methods introduced, it has been termed the *vulgar* or *old* Method.

[a] Tho' this Accident ſometimes happens to an impudent and careleſs Surgeon, it may be generally voided by the more dextrous and expert.

II. The

The Occaſion of inventing this Method.

II. The firſt Invention of this Method ſeems to me to have aroſe from an Obſervation, how eaſily large Stones are frequently voided from Women, either naturally, without any Aſſiſtance, or by Art with an extracting Force. For ROMANUS, its firſt Author, conſidering the Shortneſs and great Dilatability of the Urethra in Women, giving an eaſy Paſſage to a Stone, either ſpontaneouſly, or with the Help of Inſtruments, imagined that if an Opening was made into the Urethra of Men, near the Bladder, ſo as to leave the intermediate Part of it as ſhort as in Women, that then it might be dilated, and the Stone extracted with equal Eaſe[a]; for to cut into the Bladder, was at that Time eſteemed mortal, and therefore criminal, from the Authority of HIPPOCRATES, *Aph.* 18. *Lib.* VI. and CELSUS *Lib.* VI. *Cap.* 26. And if we rightly conſider the Caſe, the male Subject is, by this Operation, with regard to the Urethra, converted into a female, and ſo treated as ſuch: For, in this Method, a longitudinal Inciſion is made *in perinæo*, extended from the *Scrotum* towards the *Anus*, which, as it were, reſembles the Entrance of the *Vagina*, or at leaſt ſerves inſtead of it in the preſent Caſe; the *Urethra* is then opened in *perinæo* from the Letter D to F or I, *Tab.* XXIX. *Fig.* 1. So that there remains but a ſhort Part of the *Urethra* intire, between the Lips of the Wound and the Bladder, as from I to L. like as in Women; which Part being ſufficiently dilated with proper Inſtruments, the Stone may be extracted by convenient Hooks or Plyers out of the Bladder. To anſwer this Intention, it was therefore neceſſary for the Inventor to contrive a Set of Inſtruments, by which the whole might be dextrouſly performed: Accordingly he firſt invents a grooved Catheter to make an Inciſion ſafely in the *Urethra*, afterwards Directors and Dilators, to make way into the Bladder; and, laſtly, Forceps for the Extraction of the Stone: All which were at that Time, as appears from MARIANUS, but very imperfectly and indifferently fitted for their Offices, as we uſually find in the Beginning of almoſt all Inventions; but in Proceſs of Time they have received various Improvements and Advantages, ſo that at the preſent Day they ſeem to have acquired a great degree of Perfection. Though ſome of the Inſtruments employed in the *Apparatus minor* may be alſo uſed in this Method.

Neceſſary Apparatus of Inſtruments for this Method.

III. In performing Lithotomy by the *Apparatus major*, the following Inſtruments are chiefly neceſſary, *viz.* Catheters, made of Silver or Copper, of various Sizes and Diameters, according to the different Age and Make of ſeveral Patients, in order to ſearch for, or find out the Stone, as we before directed in *Chap.* CXXXVII. §. III. See alſo our Explanation in *Tab.* XXVII. *Fig.* 2, 3, 4, & 5. in treating of the *Apparatus minor*. But in this Apparatus there are alſo required grooved Catheters made of Steel of various Sizes, according to the Age or Bulk of the Patient. See *Tab.* XXVII. *Fig.* 12, 13, 14, 15. To theſe we may add the Scalpel, *Fig.* 8. or particular kind of Knife for dividing the Parts by Inciſion in Lithotomy; which, at the Time of uſing it, ſhould be wrapped up in Linen in the manner repreſented in *Fig.* 9. leaving its Point only uncovered. Two enſiform Directors or Conductors, (*Tab.* XXVIII. *Fig.* 2 & 3.) one of which has a Beak, marked A, and called *male*; the other being termed *female*, and the Handles of both are repreſented by the Letters CC. Some

[a] Tho' M. FALCONET, a Phyſician at *Paris*, in a Diſſertation on the lateral Operation, thinks it was not the Author's Intention to cut into the Urethra, but into the Neck and Bladder it ſelf. Which Opinion is moſt probable, the Reader may preſently judge.

prefer the more ſimple and excavated Conductor of HILDANUS, Fig. 4. termed a *Gorgeret* [a] by the *French*; which is approved of as more commodious by ſome, and diſapproved of by others. It will be alſo neceſſary for the Lithotomiſt to be provided with a peculiar ſort of Forceps, *Fig.* 5, 6, 7. of different Sizes and Figures, ſome being ſtraight at the Mouth, as *Fig.* 5. others incurvated, as *Fig.* 6. together with a kind of Hook repreſented in *Tab.* XXVII. *Fig.* 10. which is ſmooth on the external Surface next the Bladder, but rough and unequal on that Part, which is to intercept the Stone; to this ſhould be alſo added a kind of oblong Spoon, *Fig.* 11. AA. being furniſhed with a Button or round Head B, to be uſed inſtead of a Probe; the Inſtrument is by ſome termed *Lapidillum*, and by MARIANUS *Kerriculum*, becauſe it ſerves to extract the ſmall Fragments of Stones from the Bladder. Laſtly, in order to dilate the Wound, when the Stone is exceeding large, it is the Practice of ſome to uſe an Inſtrument called a Dilatator: Of this Inſtrument there are ſeveral kinds; but as it is ſeldom uſed at preſent, I have only exhibited one of them in *Tab.* XXVIII. *Fig.* 8. [b]. The ſeveral Inſtruments now mentioned are by ſome fixed in a ſort of a Caſe or Pouch hanging before 'em, and faſtened round their Waſte, as in *Tab.* XXIX. *Fig.* 9. *lit.* H.; others place them in a Diſh full of warm Water, in ſuch Order as may be moſt commodious for uſing them in the Operation, or elſe they only dip the Inſtruments in hot Water before they are thus diſpoſed for Uſe. It will be alſo neceſſary to be provided with a Sponge and warm Water, leſt there ſhould be occaſion to clear away the Blood from the Wound, after making the Inciſion; and the Surgeon ſhould be defended with an Apron and Sleeves to keep his Clothes clean. The Apparatus for dreſſing may be the ſame as we before directed for the *Apparatus minor*, *viz.* ſcraped Lint, the T Bandage, and a thick ſquare Compreſs, upon which may be laid the Biſtory, or Scalpel, for the Operation, as in *Tab.* XXIX. *Fig.* 9. Add to theſe, ſome highly rectified Spirit of Wine, or ſtyptic Powders, for reſtraining the Hæmorrhage, if the Flux of Blood ſhould be too conſiderable; alſo ſome ſmall crooked Needles and Thread, for taking up the bleeding Arteries, according to the Advice of Mr. CHESELDEN; and, laſtly, a Cup with Olive-oil, in which ſome of the Inſtruments are to be dipped, in order to lubricate them, and make them paſs into the Bladder with more Eaſe.

An EXPLANATION *of the* TWENTY SEVENTH PLATE.

Fig. 1. Repreſents the Copper or Silver Pipe called a *Catheter*, which is chiefly uſed in Women for diſcharging the Urine in a Suppreſſion, and to ſearch for the Stone.

Fig. 2, 3, 4, 5. Are Silver Catheters of various Sizes, to be applied for the ſame purpoſes in male Subjects, according to the different Age and Size of the Patient's Body. The Letter AA denotes the Handle of the concealed Silver Wire, whereby it is to be drawn out of the Cannula, when that may be neceſſary; BB the two oblong Apertures at the Extremity of the Inſtrument, which admits the Urine to be diſcharged; CC the Handles of the Catheters.

[a] Which has been long ago deſcribed and figured by P. FRANCUS in Lib. *de Herniis*.

[b] Others may be ſeen in MARIANUS, ANDREAS A CRUCE, PAREY, P. FRANCUS, TOLET, DIONIS, LE DRAN, &c.

Fig.

Fig. 11.

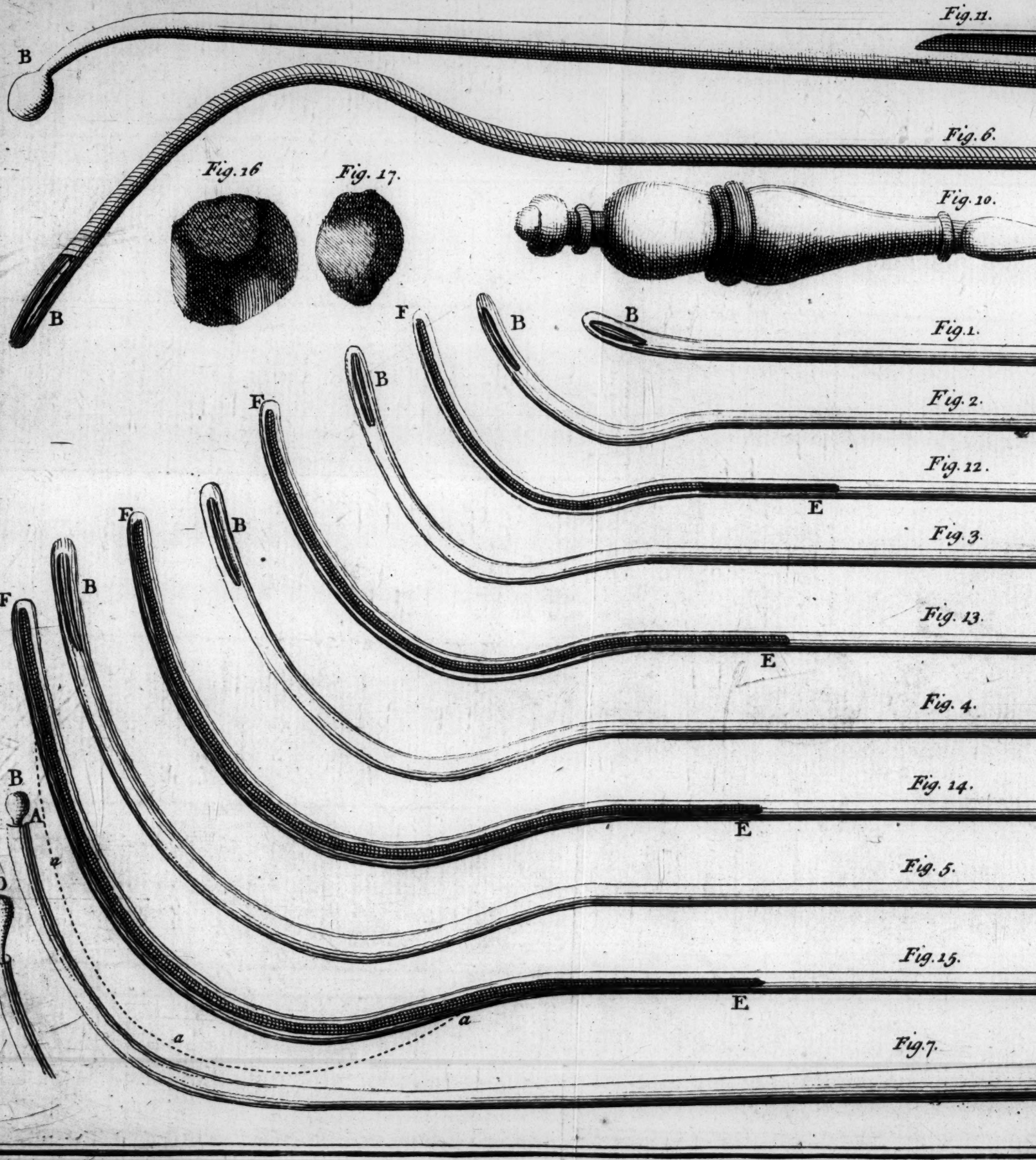


Fig. 6.

Fig. 16

Fig. 17.

Fig. 10.

Fig. 1.

Fig. 2.

Fig. 12.

Fig. 3.

Fig. 13.

Fig. 4.

Fig. 14.

Fig. 5.

Fig. 15.

Fig. 7.

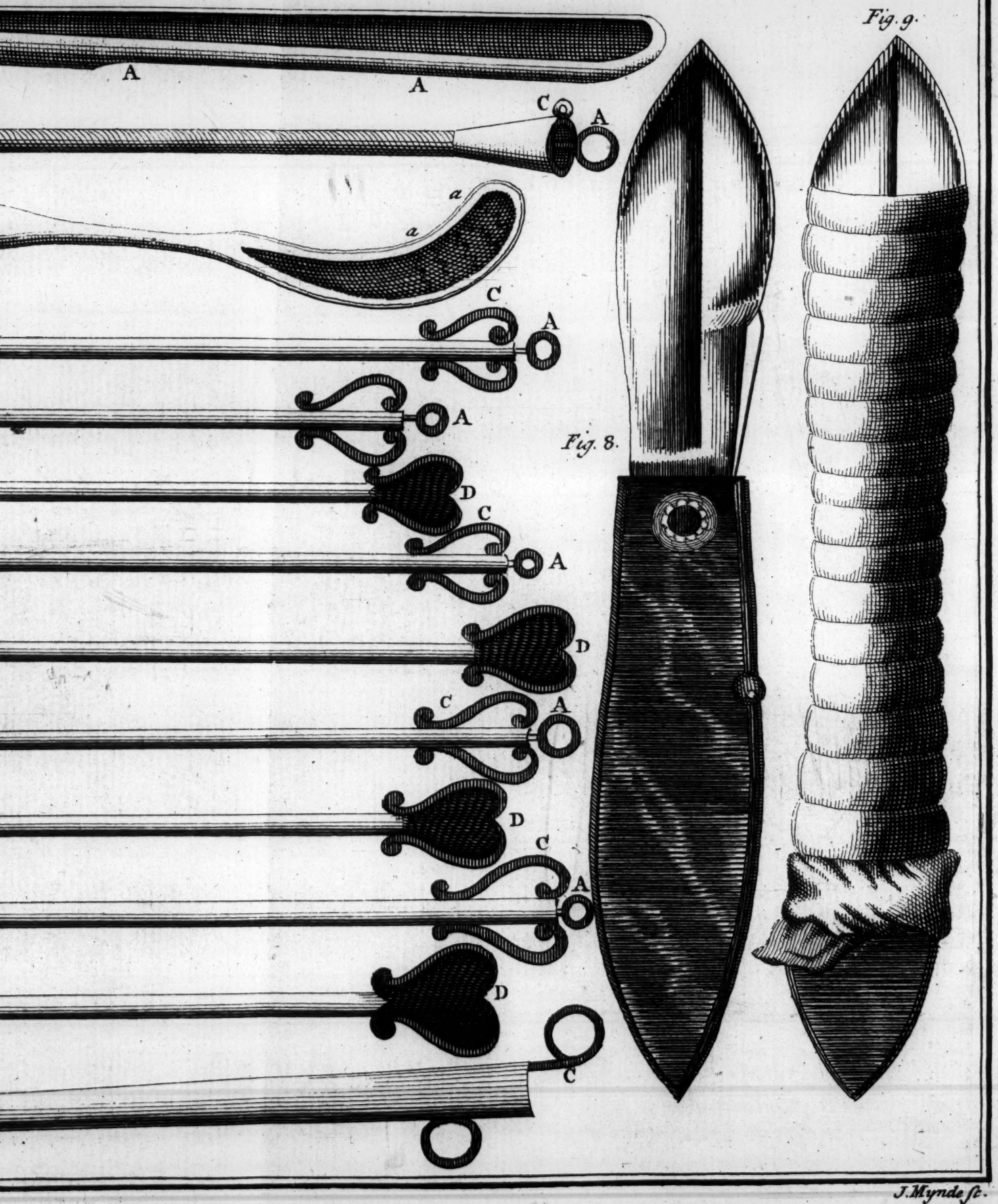


Fig. 8.

Fig. 9.

J. Mynde sc.

Fig. 6. Repreſents a Silver Catheter which is flexible, the Uſe of which is ſometimes very neceſſary and convenient to be left in the Bladder and Urethra to diſcharge the Urine, when another Catheter muſt be introduced ſeveral Times ſucceſſively, as when the urinary Paſſage is totally occluded by ſome Calculus, *&c.* in which Caſe the flexible Catheter may be commodiouſly left in the Bladder and Urethra, without endangering an Inflammation of thoſe Parts, by repeated Introductions of the other kind of this Inſtrument. The Letters A, B, C, denote the ſame here as in the preceding Inſtrument.

Fig. 7. Repreſents a Silver Catheter of another kind, which is without the Lateral Apertures; having only one opening at its End marked A, which is ſhut by the pyriform Button marked B, which is in a manner the End of the included Wire; if the Handle of the Wire C be preſſed forwards, the Button comes out in the manner repreſented by D in the adjacent Figure, by which means the ſuppreſſed Urine will enter by the Mouth of the Catheter, and be conveyed out of the Bladder.

Fig. 8. Is a large Scalpel, or Biſtory, opened and naked, ſuch as hath been hitherto moſt in Uſe for the Operation of Lithotomy; it is by ſome termed Lithotomus.

Fig. 9. Is the ſame Inſtrument, armed with a Piece of narrow Linen wound round it, in ſuch manner as not to leave above an Inch of the Edge uncovered, ſufficient to make the Inciſion.

Fig. 10. Is the Scoop which is ſometimes neceſſary for extracting the Stone in the ſeveral Methods of Lithotomy; it being furniſhed with ſmall Teeth in its concave Part, for the more firmly holding or retaining the Calculus.

Fig. 11. A Steel Inſtrument having an oblong, but narrow Spoon at one End; and being round at the other, is alſo furniſhed with a round Button, which may perform the Office of a Probe and Director, which is often uſed with various Intentions for the Stone in the Bladder by the Lithotomiſts.

Fig. 12, 13, 14, & 15. Denote Steel and grooved Catheters, which are commonly uſed in cutting for the Stone by the Apparatus major, that the Knife may be guided into the Groove. DD repreſent their Handles, EF their Grooves.

Fig. 16, 17. Are two Stones of an unuſual Size, which I ſucceſsfully cut out of a Sacculus, or Hernia, in the Urethra before the Scrotum.

IV. The ſeveral neceſſary Inſtruments being thus provided, the next Buſineſs is to diſpoſe and ſecure the Patient in a proper Poſture for the Operation; that he may not injure himſelf, and obſtruct the Operator by his irregular or obſtinate Motions. In moſt Hoſpitals, where this Operation is very frequently performed, they are provided with a particular kind of Table for this purpoſe, repreſented in *Tab.* XXVIII. *Fig.* 9. the manner of placing the Patient upon which, is repreſented from the *Italian* Lithotomiſt ALGHISH, in *Tab.* XXIX. *Fig.* 9. Sometimes a proper Chair is uſed inſtead of the Table, one or two of which is figured by TOLET in his Treatiſe of Lithotomy, but are not very often uſed at the preſent Day. But if one of theſe Chairs is not at hand, a common oval or ſquare Table of about four Feet long, and three broad, will be ſufficient for that purpoſe, placing thereon a kind of Seat to be raiſed or depreſſed to ſupport the Patient's Back, as in *Tab.* XXVIII. *Fig.* 9. The Patient is to be placed in

Poſture of the Patient.

ſuch a manner on the Edge of this Table marked B, that he may ſit as in a Chair, his Back being ſupported by the inclined and moveable Part of the Table marked C, his Thighs are then to be bent and diſtended in ſuch a manner that his Heels may touch his Buttocks AA, and his Knees being divaricated, his Hands are held faſt about his Hams as RAVIUS adviſes, or near his Ancles, to which it may be proper to ſecure them by Ligatures, in ſuch a manner that he cannot eaſily move himſelf (ſee *Tab.* XXIX. *Fig.* 9. & 10.) as we ſhall relate more particularly in explaining that Table.

Poſture of the Aſſiſtants.

V. It is generally neceſſary to provide three or four ſtrong and courageous Aſſiſtants to ſecure the Patient firmly in a proper Poſture for the Operation. See *Tab.* XXIX. *Fig.* 9. Two of theſe Aſſiſtants repreſented by CC, are to ſecure the Patient's Legs on each Side, in ſuch a manner as to hold his Foot faſt in one Hand, and his Knee in the other, drawing it at the ſame time to one Side. The third Aſſiſtant is to ſtand behind, and keep the Patient down on his Back cloſe to the Table; and the fourth is to ſtand on the right Side of the Patient, or on the Table, in ſuch manner as to hold up the Scrotum with one Hand, and to hold the Catheter, upon Occaſion, with his other. A fifth Aſſiſtant may ſtand on the right Side of the Surgeon, that he may hold in Readineſs, give and receive the ſeveral Inſtruments neceſſary for Lithotomy. Sometimes three Aſſiſtants will be ſufficient for this purpoſe, diſpoſed in the manner repreſented by *Fig.* 9. *Tab.* XXIX. from ALGHISH; that is, for two Aſſiſtants to hold the Extremities on each Side, and the third to ſtride a-croſs the Table, ſo as to hold the Patient betwixt his Legs and Thighs; and for the drawing up the Scrotum, *&c.* as before. At the Extremity of the Table near the Surgeon ſhould be placed a Veſſel to receive the Blood and Fæces that may be diſcharged from the Patient; and near the ſame ſhould be alſo placed a Cup of Oil, and a Pan of hot Water to warm the Inſtruments, and lubricate them before they are paſſed into the Bladder; as alſo waſh off any Sand or Filth from them, and to cleanſe the Wound from its extravaſated Blood by means of a Sponge. Theſe ſeveral Neceſſaries being made ready, the Surgeon may then enter on his Work in the following Manner.

The manner of Operating or Cutting.

VI. In the firſt Place the Surgeon is to put off his Coat, if it will be any Incumbrance to him, and having dipped the End of one of the Steel grooved Catheters in Oil, ſizable to the Patient, he then introduces it through the Urethra into the Bladder, according to the Directions given in Chap. CXXXVI. §. III. and therewith ſearches a ſecond time, to ſee if he can find a Stone; leſt the firſt Tryal ſhould deceive him, as it ſometimes does. If then the Surgeon and his Aſſiſtants are ſatisfied of a Stone being concealed in the Bladder, the convex Part of the Catheter is thereupon turned in the Bladder and Urethra towards the left Side of the Perinæum; but the Handle of the Inſtrument, together with the Penis containing it, is gently inclined towards the right Side or Inguen; in which Poſture the Surgeon uſually orders it to be held by one of the Aſſiſtants, whoſe Office is to hold up the Scrotum: By this means the convex Part of the Catheter elates that Part of the Perinæum and Urethra, which are to be divided in the Operation, and renders them ſufficiently obvious both to the Eye and Touch. This done, the Surgeon elevates the Integuments of the Perinæum with the Fingers of his left Hand, and draws them towards the right Side of the Patient: In his right Hand the Surgeon at the ſame time holds the

Knife bound round with a piece of Linen (as at *Fig.* 9. *Tab.* XXVII.) in the ſame Poſition as we generally hold a Pen in writing, and therewith makes a longitudinal Inciſion downwards, in the middle of the Perinæum, near the *Raphe*, or Suture, thus dividing thro' the *Membrana adipoſa*, till his Finger can perceive the Catheter in the Neck of the Bladder and Urethra, which is then to be divided perpendicularly downward, in ſuch Manner that the End of the Scalpel may paſs in the Groove of the Catheter; becauſe in this Method of performing Lithotomy, only the Urethra is to be divided, and the Neck of the Bladder left entire. Thus by paſſing the Scalpel in the Groove of the Catheter, there will be no Danger of wounding Parts which would be improper to be divided. Some begin their Inciſion near the middle of the Perinæum, and continue it downward; others make their Inciſion from below upward towards the Scrotum; but I think the laſt Method is not ſo often practiſed. The external Orifice of the Wound made is to be larger or ſmaller, in proportion to the Patient's Habit of Body, and Size of the Stone to be extracted; but it is generally made about two Fingers Breadth in Children, and three or four in adults; and the Inciſion in the Urethra, internally, is continued (ſee *Tab.* XXIX. *Fig.* 1.) thro' the Bulb E from D, to the Beginning of the Neck of the Bladder F or I [a]. But when the Surgeon is going to divide the lower Part of the Urethra, his Hand and Knife are to be inclined, while, according to the Direction of Meſſ. CHESELDEN and LE DRAN, the End of the Catheter, which had been hitherto preſſed downward, is now to be elevated or preſſed ſtrongly againſt the Symphyſis, or Angle of the *Oſſa pubis*, by which means the *Urethra* is drawn as much as poſſible from the *Inteſtinum rectum*, which, without this Precaution, might eaſily be wounded. At the ſame time Care ſhould be alſo taken to prevent the Point of the Knife from ſlipping out of the Groove of the Catheter. Some Lithotomiſts commit the Integuments of the *Perinæum* to be divaricated by the aſſiſting Surgeon, who holds up the *Scrotum*, holding the Catheter in its proper Direction with their own Left-hand: But in this reſpect the Surgeon may act as Conveniency and Diſcretion may direct him.

VII. A ſufficient Opening being thus made by Inciſion, the Knife is then returned by the Surgeon to the Aſſiſtant, who firſt gave it; at the ſame time diligently obſerving the Groove of the Catheter, in which, if it be held by an Aſſiſtant, he keeps the Nail of the Fore-finger or Thumb of his Left-hand. The Lithotomiſt then takes a Male-conductor from his Pouch, or the Hand of an Aſſiſtant, and after dipping it in warm Oil, ſlides the End of it cautiouſly thro' the Groove of the Catheter into the Bladder, which done, he extracts the Catheter. Some leave the End of the Knife in the Groove of the Catheter, which is in that manner held by an Aſſiſtant, 'till they have thereby guided the End of the Conductor into the Groove of the Catheter; becauſe it would otherwiſe be a difficult Matter, eſpecially in fat Subjects, to paſs the end of the Conductor into the Groove of the Catheter, which would be covered and obſcured by the Protuberance of the fat. The Male-conductor being thus introduced thro' the Groove of the Catheter into the Bladder, a female Conductor is alſo introduced upon the former, by its Sulcus B, (*Tab.* XXIX. *Fig.* 2, 3.) being

What is to be done with the Conductors after the Inciſion.

[a] The Poſition of the Bladder and Urethra is accurately deſcribed for the Uſe of the Lithotomiſt by MORGAGNI in *Adverſ. Anat.* III. *pag.* 82 & 97.

guided on the ſharp Back of the other, ſo as to paſs eaſily and ſafely into the Bladder thro' its Neck. This done, the two Conductors are gradually divaricated from each other by their two Handles C C; and the Neck of the Bladder being by that means dilated, a Pair of ſtraight Stone-forceps, which have been firſt warmed and dipped in Oil, are carefully introduced cloſe ſhut betwixt the Conductors into the Bladder; by which means the Neck of the Bladder is again in ſome meaſure further dilated. My own Practice is to thruſt the Fore-finger of my Right-hand, dipt in Oil, betwixt the two Conductors, before introducing the Forceps; by which means I gently dilate the Neck of the Bladder, for the more eaſy Entrance of the Forceps. It is a certain Sign that the Forceps are paſſed into the Bladder, if you find they will eaſily open; but if they will not yet open, 'tis a Sign they are not in the Bladder, but muſt be introduced further thro' its Neck. Some of the Surgeons of *Paris* introduce the Fore-finger of their Right-hand into the Bladder, upon the male Conductor, before they introduce the female one, and then by Inverſion they endeavour to dilate its Neck; but LE DRAN wiſely obſerves, that the ſtrict Neck of the Bladder is ſo filled with the Conductor, that the Finger cannot be alſo haſtily introduced thro' it, as ſome do with Precipitation, without endangering a Laceration, and the moſt excruciating Pain; and therefore the firſt Method is, in my Opinion, the more adviſeable. Others, again, proceed in a different Method, uſing only the ſingle cannulated or grooved Inſtrument, called by the *French* a *Gorgeret*, (*Tab.* XXVIII. *Fig.* 4.) inſtead of the two Conductors beforementioned. Theſe, having firſt made an Inciſion as before, paſs the End of the Gorgeret thro' the Groove of the Catheter into the Bladder, as we directed for the male Conductor; only ſome help forward the Inſtrument with their Fore-finger. The Gorgeret being thus introduced into the Bladder, if it contains any Urine, it runs out thro' the Groove of the Inſtrument, which is alſo a ſure mark of its being paſſed into the Bladder. The Catheter is then taken out of the Urethra, and the Gorgeret gently turned round on every ſide by the Surgeon, in order to dilate gradually the Neck of the Bladder; then taking the Gorgeret by the Handle B B in his Left-hand, he carefully introduces the ſhut Forceps, with his Right-hand, through the Groove C C, into the Bladder.

Le Dran's Obſervations

VIII. LE DRAN, who prefers and uſes the Gorgeret before the other enſiform Conductors, having paſſed that Inſtrument into the Bladder, gently thruſts the Fore-finger of his Right-hand thro' the Wound into the Groove of the Inſtrument, and therewith dilates the Neck of the Bladder for the more eaſy Paſſage of the ſhut Forceps, which he afterwards introduces thro' the Groove of the ſame Inſtrument; tho' indeed the ſame Practice was deſcribed before LE DRAN by one of my own Pupils[a]. But he was probably the firſt who obſerved, from morbid Diſſections, that the whole Neck of the Bladder was almoſt conſtantly ſlit or lacerated, as well as expanded by the Method of dilating in the Apparatus major; notwithſtanding it was often attended with no bad Conſequences, eſpecially when done cautiouſly and gradually: For by that means the Forceps not only meet with a more eaſy Paſſage into the Bladder, but the Stone itſelf may be alſo extracted afterwards with much more Eaſe, and leſs Danger. The ſliting or lacerating the Neck of the Bladder, and pro-

[a] ROSA, in Diſſert. de Calculo Veſicæ, *Argentorat.* Ann. 1723.

ſtrate,

ſtrate, by a gradual and gentle Dilatation, was the leſs to be feared, inaſmuch as without it there conſtantly appeared, in the dead Subjects who had ſuffered this Method of Lithotomy, a more dangerous and dreadful Laceration, occaſioned either by the more violent Intruſion of the Forceps, Dilatation of the Parts, or Extraction of the Stone [a].

Lithotomiſts are not agreed as to all the Parts which ought to be divided in making their Inciſion for the *Apparatus Major*. The Generality of them are for dividing the *Urethra* only, without at all cutting the Bladder itſelf, or its Neck; in which Opinion we find TOLET, and many others: But we before obſerved, in §. II. of this Chapter, that M. FALCONET is of Opinion, that the Authors of this Method of Lithotomy intended and deſigned, that the Neck, and even the Bladder itſelf, ſhould be inciſed in the Apparatus major, as they are uſually in the Apparatus minor. M. NOEL ſays expreſly, That "the Neck of the "Bladder is the Part where the Inciſion is conſtantly made in this Operation; "and that Brother JAMES's Method differs from the Apparatus major only in "the Parts externally divided." So alſo we find, that M. ROSA orders the Sphincter, that is, the Neck of the Bladder, to be divided in the Apparatus major, *p.* 23. and SCHAFFERUS [b] writes, that, in this Method of Lithotomy, not only the Neck, but alſo Part of the Bladder itſelf, ſhould be inciſed.

IX. When the Forceps are introduced into the Bladder, after the Conductors are extracted, they are to be ſtrongly opened ſeveral times to dilate the Opening, and then ſhutting them cloſe together again, the Stone is to be gently ſearched for [c]. While the Surgeon is ſearching for the Stone with the Forceps, he ſhould keep them ſhut cloſe all the Time, leſt ſome Part of the Bladder ſhould be intercepted and pinched by them; for which Reaſon too, the Jaws of the Forceps ſhould be of ſuch a Make, as not to meet cloſe at their Extremity, as may be ſeen in the Forceps repreſented in *Tab.* XXXI. *Fig.* 12. When the Stone is found, the Forceps are to be opened by applying both Hands dextrouſly, ſo as to lay hold of the Stone in ſuch a manner, if poſſible, that one Jaw of the Forceps may be underneath it, and the other above, the Advantages of which have been remarked by LE DRAN (*pag.* 65.) The Stone being thus held faſt in the Forceps is to be preſſed downwards towards the Rectum, and by gradually inclining the Forceps from one ſide to the other, it is to be cautiouſly extracted downward, becauſe the Parts more eaſily dilate and yield that way than upwards, from the Reſiſtance of the *Oſſa pubis*. Thus the Stone is often eaſily and ſpeedily extracted, when it is not very large, or rough; but when it is of an unuſual Size, or an unequal and prickly Surface, the Taſk proves difficult. But if the Stone cannot well be intercepted by the Forceps, becauſe of its Concealment in ſome Cell or Fold of the Bladder, as it frequently happens towards the *Rectum*; in that Caſe the Surgeon is to introduce the two firſt Fingers of his left Hand into the *Anus* of the Patient, to thruſt the Stone into the Forceps, that it may be well ſecured in them, ſo as to be extracted without further Difficulty. But if the Stone adheres to the upper Part of the Bladder behind the *Oſſa pubis*, the inferior Part of the Abdomen is to be preſſed downward with the Hand, that the Stone may be more commodiouſly intercepted and extracted by

Uſe of the Forceps.

[a] See his Parallel of the different Methods of performing Lithotomy.
[b] Apud MEYERUM in Obſ. Chirurg de Lithot. pag. 75 & 74.
[c] Diſſert. de variis Lithotomiæ generibus, *Argentorat.* Ann. 1724. pag. 7.

the

the crooked or ſtraight Forceps. If the Stone lodges on the right or left Side of the Bladder, it may often be laid hold of, and extracted more conveniently by the crooked Forceps repreſented in *Tab.* XXVIII. *Fig.* 6. But to prevent the Stone from being broken by a too ſtrong Compreſſion with the Forceps, it may be proper to thruſt the Finger and Thumb of the left Hand on each ſide the Stone betwixt the Forceps, to preſerve the ſame; for it is always much better to extract the Stone whole, when that is practicable, than to break it into Fragments. If the Stone cannot be readily found by the Forceps, LE DRAN takes them out of the Bladder, and introduces his Finger, by which he places the Stone in a fit Poſition at the Neck of the Bladder, and then, by laying hold of it with the Forceps, extracts the ſame.

How the Forceps are to be managed when they open too wide.

X. If the Handles of the Forceps marked DD. *Tab.* XXVIII. are too much divaricated, after laying hold of the Stone, it cannot then be well extracted without great Danger of violently lacerating the Bladder, particularly its Neck, and the proſtrate Gland; therefore the Cauſe of this too wide opening of the Forceps is to be more particularly ſearched for, which may be beſt done by introducing the Finger, or, when that is impracticable, the kind of Probe armed with a Button, *Tab.* XXVII. *Fig.* 11, 13, with which the Lithotomiſt is to ſearch, betwixt the Jaws of the Forceps, whether or no the Stone, being of an oval or oblong Figure, is not held in the Forceps tranſverſly, or lengthwiſe. If the Stone be in this Poſition in the Forceps, it is to be let looſe, and again taken hold of by them in its leaſt Diameter; which may be done by the Direction of the Finger, or the forementioned Inſtrument, whereby it may be extracted with much leſs Danger and Difficulty than before. But if, notwithſtanding all this, the Stone continues to open the Forceps very wide, the Surgeon is then to uſe his beſt Endeavours to extract the ſame: In order to which, he is to take hold of the two Handles DD in his right Hand, and graſping that Part of the Forceps next the Wound with his left Hnnd, he is then to pull the Forceps and Stone gradually from one ſide to the other downwards, becauſe the lower Part of the Wound more eaſily dilates than the upper, having none of the Reſiſtance of the *Oſſa pubis*. But if the Stone proves ſo large as to reſiſt the ſize of the Wound, and all the Surgeon's Endeavours for its Extraction entire, it ſhould then be broke to pieces by a large pair of Forceps with Teeth, repreſented in *Tab.* XXVIII. Fig. 7. which may be full as large again as the Figure; and thus the Stone may be extracted one piece after the other. But laſtly[a], if the Stone is ſo hard and compact, as well as large, that it cannot be extracted nor broke to pieces by the Forceps, as we are told formerly happened to Profeſſor BORRICHIUS[b]; then the Caſe is deplorable, being generally fatal, as it was to him. A prudent Surgeon will, in ſuch a Caſe, leave the Stone in the Bladder, and heal up the Wound, or elſe leave it a Fiſtula, thro' which the Urine may be diſcharged, rather than torture the Patient to no purpoſe, by forcing the Forceps to ſuch a degree, that he dies in the Operation, which was the Caſe of BORRICHIUS. Some Lithotomiſts, but few with Succeſs, make uſe of a ſteel Inſtrument to dilate the Wound, commonly termed a *Dilatator*, reſembling that in *Tab.* XXVIII. *Fig.* 8. But the Inſtrument has not been thought

[a] CELSUS (*Lib.* VII. *Cap.* 26. *N.* 3.) tells us, that AMMONIUS was the firſt who adviſed breaking the Stone.

[b] In the Account of his Life among the more Illuſtrious Chemical Writers.

ſafe and convenient enough to be brought into Uſe among our modern Lithotomiſts. For it can hardly ever be uſed, to make any conſiderable Dilatation, without violently contuſing and lacerating the Parts, which, being very nervous and ſenſible, makes the Pain, which is already very great, ſtill more excruciating, and often followed with a violent Inflammation, a Gangrene, and a cancerous Diſpoſition, or other moſt malignant Symptoms. Sometimes the Stone cannot be compreſſed with Force enough to break it by the Forceps, becauſe it lies too near the Hinge or Flexure of the Inſtrument, *Tab.* XXVIII. *Fig.* 5. Therefore it may, in that Caſe, be proper to preſs back the Stone nearer to the Extremity of the Jaws of the Forceps, by introducing the button end of the Scoop, *Tab.* XXVII. *Fig.* 11. B. or in its ſtead, the fore Finger. To prevent the Forceps from being apt to hold the Stone too near their Hinge, it may be proper to have them made ſmooth in that Part, having Teeth only at their Extremity, as we have repreſented in *Tab.* XXVIII. *Fig.* 5. & 6. *litt.* A & B. by which means the Stone will of itſelf ſlide from the Hinge, and ſtick only at the Teeth, towards the Extremity of the Forceps. M. Francus de Franckenau does indeed take notice [a], of a Machine that was uſed by a Lithotomiſt at the *Hague*, inſtead of a Forceps for extracting the Stone, which was compoſed of Whalebone and an Ox's Bladder. whereby he endeavoured to avoid the Injury offered to the Bladder and other Parts by the common Forceps; but he neither deſcribes the proper Size and Structure of the Inſtrument, nor the manner in which it was uſed.

What is to be done after extracting the Stone.

XI. When a Stone has been extracted agreeably to the Directions preceding, the Surgeon ſhould then, eſpecially if the Stone has a ſmooth Surface, introduce his Fore-Finger, or the probe end of the Scoop before mentioned, in order to ſearch whether any other Stone or Fragment be yet remaining in the Bladder, which could not well be determined before the Operation. If there be more Stones yet remaining, the Forceps are to be again introduced into the Bladder, either with the Finger, or the Conductors, and the Extraction of them made in the manner which we have but now explained: And thus the Lithotomiſt is to continue till the Bladder is cleared. If Gravel only, or ſome ſmall Fragments of the Stone be found remaining, they may be more commodiouſly extracted by the oblong Spoon or Scoop, *Tab.* XXVII. *Fig.* 11. A; or if the Patient be very weak, and almoſt ſpent in the Operation, the Expulſion of them may be left to Nature; for the Urine generally diſcharges and waſhes out what ſabulous Matter and Fragments of the Stone are left after the Operation. When the Bladder has in this manner been carefully cleanſed, it is the Practice of ſome Surgeons to inſert a large Tube, *Tab.* II. *Fig. P.* either flexible or inflexible, and others again inſert a Tent into the Wound, over which they apply a Plaſter, Compreſs and the Bandage T; thinking by that means to more effectually cleanſe the Bladder from Sand or other Fæces: But it is the Advice of my ſelf and others, with Brother James and Ravius, to inſert nothing in the Wound, and that for very good Reaſons; for without a Tube, Tent, or any thing of the like Nature, the Blood, Sand, and other Fæces are waſhed freely away by the Urine, which flows thro' the open Wound; whereas they would be retained by the Uſe of thoſe things, and the Wound would be probably

[a] In Act. Eruditor. Lipſienſ. *Ann.* 1726. *pag.* 42.

there-

thereby converted into a Fiſtula, attended with very bad Symptoms. In extracting the Stone, it ſometimes ſlips out of the Forceps, and lodges in the Wound; in which Caſe we ſhould immediately endeavour to lay hold of it again without extracting the Forceps; but if they are already out of the Wound, the two fore Fingers dipt in Oil ſhould be inſtantly introduced into the Patient's Anus, in order to preſs the Stone towards the Mouth of the Wound, and then to extract it cautiouſly by the Uſe of Forceps or a Hook.

An EXPLANATION *of the* TWENTY EIGHTH PLATE.

Fig. 1. Repreſents the manner in which the Male Child is to be ſecured for the Operation, according to the Direction of CELSUS and TOLET; which, in my Opinion, ſeem to be neither very proper nor convenient.

Fig. 2 & 3. Repreſent the enſiform Conductors, which are, by many Lithotomiſts, uſed in the Apparatus major, and in the lateral Operation. That at *Fig.* 2. is furniſhed with a ſmall oblong and obtuſe Beak A, and is thereby denominated *Male*; the other at *Fig.* 3. *litt.* B. has a Groove, and is generally termed the *female* Director.

Fig. 4. Exhibits the concave or cannulated Conductor, called by the *French* a *Gorgeret*, which is by moſt Lithotomiſts generally preferred to the two preceding: A is the Beak of the Inſtrument, which is tranſmttted thro' the Groove of the Catheter, BB its cruciform Handle, CC its Channel or Groove through which is paſſed the Finger, and then the Forceps into the Bladder.

Fig. 5. A *Volſella*, or Pair of ſtraight Forceps for extracting the Stone out of the Bladder, of which kind it is neceſſary to have ſome larger, and furniſhed with Teeth within the Extremity of their Mouth.

Fig. 6. A Pair of the ſame Forceps crooked, ſerving to take hold of the Stone, when it is lodged on one ſide of the Bladder.

Fig. 7. Repreſents a Pair of large Forceps furniſhed with large and ſharp Teeth of a pyramidical Figure, fitted for breaking large Stones within the Bladder: But the Inſtrument may be made as large again as the Figure, to exert the greater Force.

Fig. 8. Repreſents the Inſtrument termed a *Dilatator* by the Generality of Surgeons, being the moſt ſimple of the kind deſcribed by any Author, and ſerving to dilate the Wound made in Lithotomy; tho' the Inſtrument is at preſent hardly ever made uſe of. The Beak A, like a Crane's Bill, is inſerted into the Wound, and the two Arms (BB) being preſſed together, the Beak of the Inſtrument opens by means of the Hinge marked C.

Fig. 9. Shews a commodious Table adapted for performing the Operation of Lithotomy, marked at each Corner with the Letters AAAA. The Letter B denotes the Place upon which the calculous Patient is to be ſeated, being made hollow, or ſemilunar, that the two Angles AA may the more commodiouſly ſupport the Feet. C the Prop for ſupporting the Patient's Back; which, for the greater Conveniency, is capable of being elevated or depreſſed more or leſs, to raiſe the Patient higher or lower, as the Surgeon may ſee proper, by means of the iron Rod marked D.

Fig. 2.

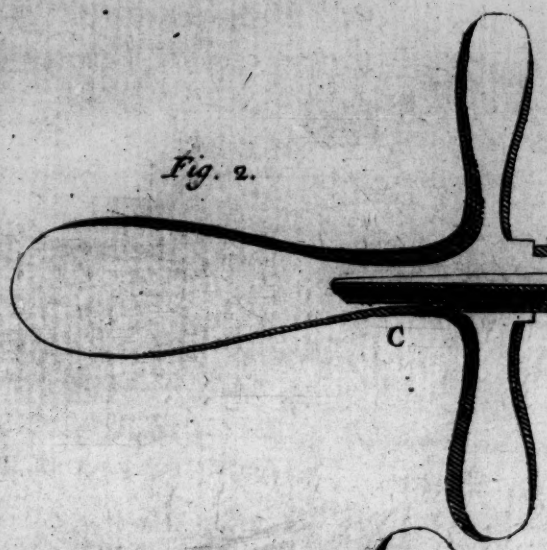


Fig. 5.

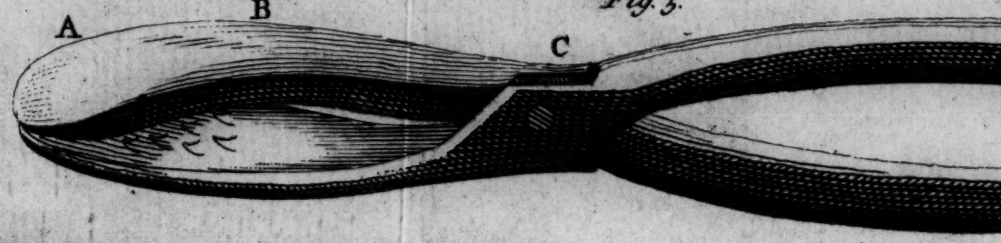


Fig. 6.

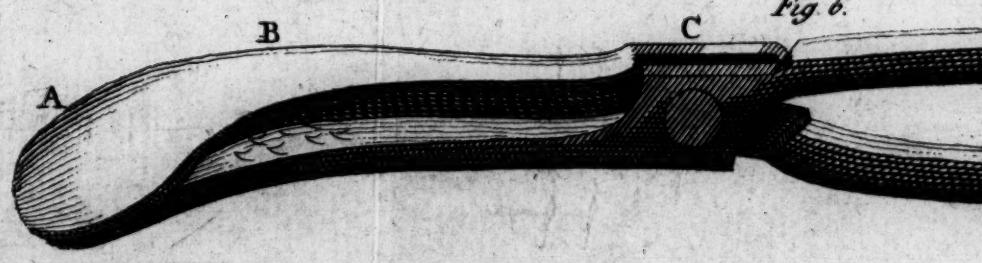


Fig. 3.

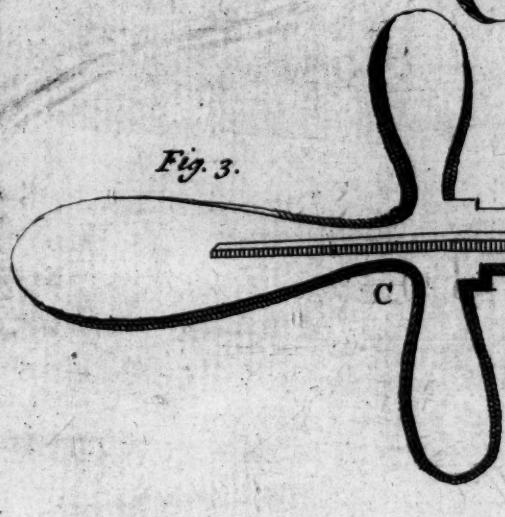


Fig. 7.

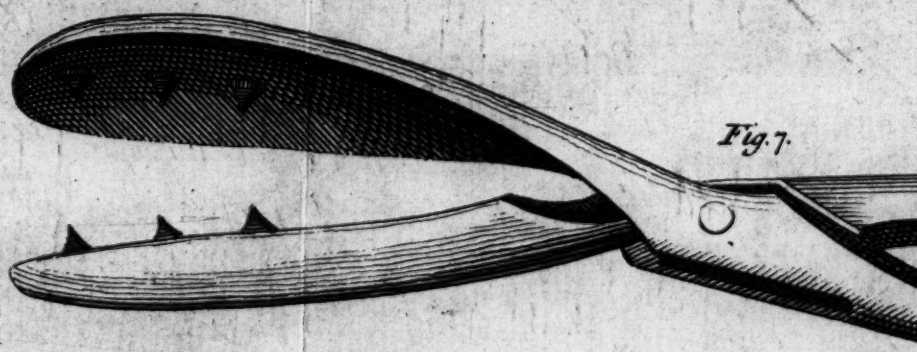


Fig. 4.

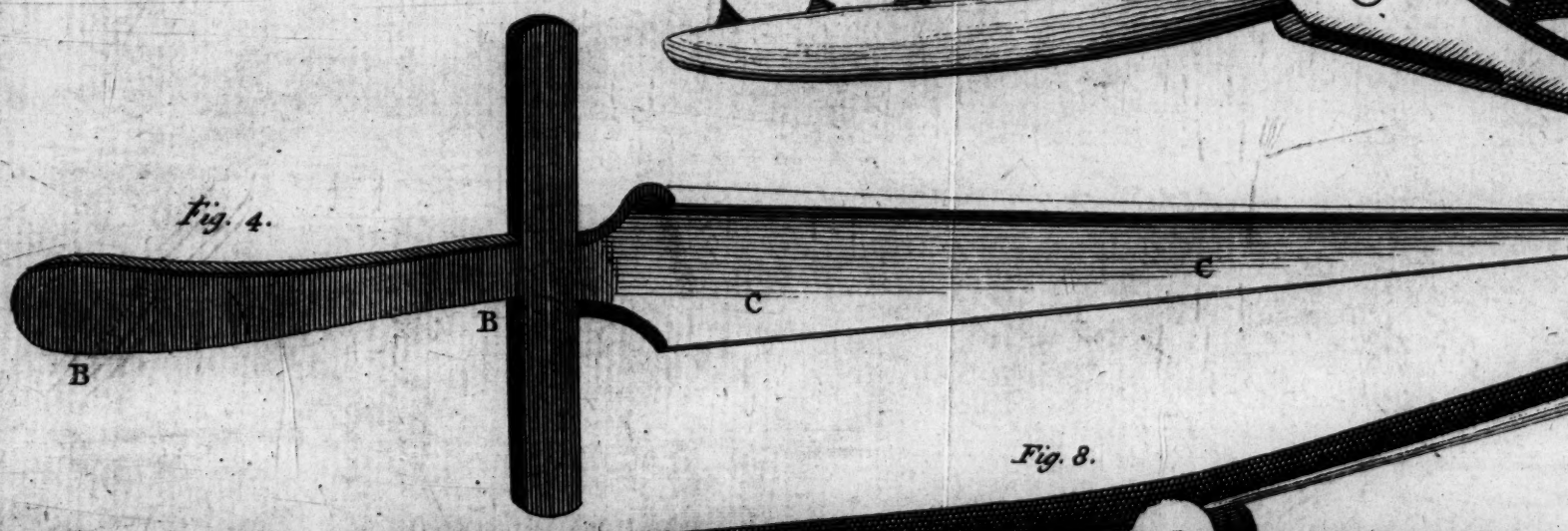
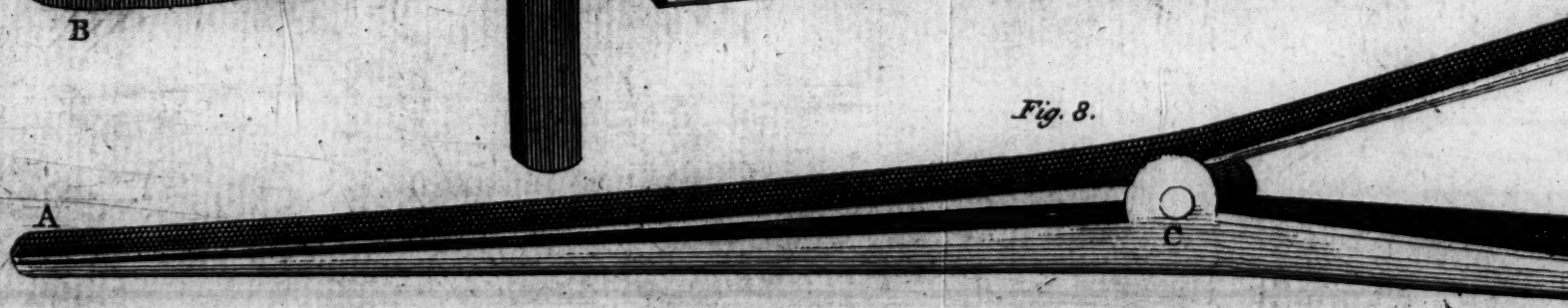


Fig. 8.



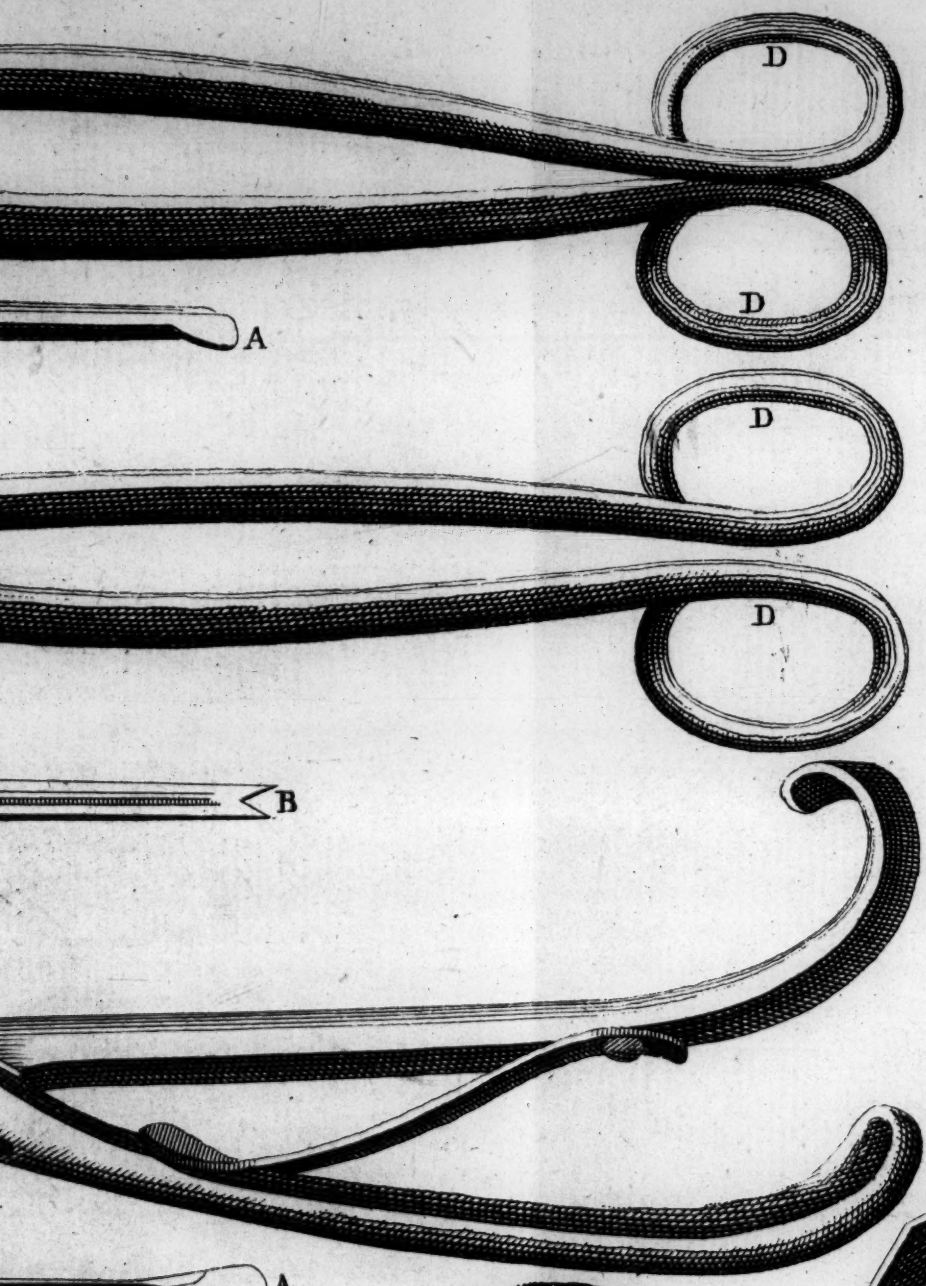


Fig. 1.

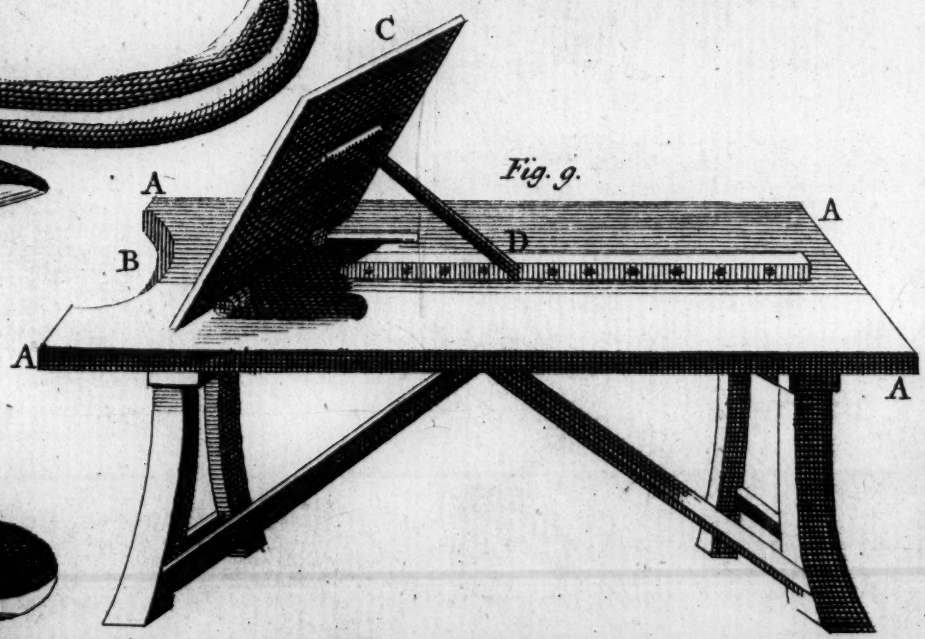


Fig. 9.

J. Mynde sc.

XII. We have already explained the manner in which the Operation is to be performed, and Stone extracted by the Surgeon; it therefore now only remains for us to deſcribe the Dreſſing and Regimen, and to propoſe a few Cautions. The Patient's Wound being cleanſed with a Sponge, and the Ligatures untied, he is firſt of all to be placed immediately in a Bed, covered with an Oil-cloth, or one that has been waxed, over which may be laid a Linen-ſheet folded together immediately under the Patient, to prevent the Bed and Pillow from being ſpoiled by the Blood and Urine diſcharged from the Wound, for a few Days after the Operation. The Patient being in this manner properly diſpoſed, the Wound is to be dreſſed with ſome doſſils of ſcraped Lint. If the Patient be ſtrong, and his Wound bleeds, it may be proper to let it continue ſo for a while, in order to reſtrain or prevent an Inflammation, as CELSUS adviſes: But if there be too large a Profuſion of Blood, which ſeldom happens, it is to be prudently reſtrained, by applying Pledgits of Lint dipt in the beſt, or moſt highly rectified Spirit of Wine, or ſome other ſtyptic Liquor; or the Wound may be ſprinkled with ſome proper ſtyptic Powder, and the Arteries compreſſed with the Fingers till the Hæmorrhage ceaſes, or becomes inconſiderable. The Pledgits of Lint are then to be covered with a Linen Bolſter, and a large ſquare Compreſs, but without any Plaſter; ſecuring the whole Dreſſing by applying the T Bandage, (*Tab.* II. *Fig. h.*) or that with four Heads, *Fig. d.* If theſe means prove inſufficient, the bleeding Arteries may be tied up with a crooked Needle and Thread[a]. Nor does it ſeem to be an improper Practice among the *French* Surgeons, who at intervals anoint the *Scrotum*, *Perinæum*, and Part of the Abdomen, for the firſt four Days with the *Ol. Roſar.* and then cover the Parts with Linen Rags dipt in *Oxycrate*, before they apply their Bandage, others only apply *Oxycrate* with large Compreſſes to the Abdomen. Many Surgeons are for making a ſtrict Bandage upon the Parts at the firſt dreſſing, though there be no conſiderable Hæmorrhage; becauſe, ſay they, the Agglutination of the Wound will by that means be more eaſily and expeditiouſly performed. Others, on the contrary, will have the Bandage to be made very ſlack for the firſt few Days, that whatever Parts of Gravel, Fragments of the Stone and Blood may remain in the Bladder, might by that means have a free Paſſage through the Wound. And others, for the ſame Reaſon, adviſe, with the celebrated RAVIUS, to uſe no bandage at all; except too great a Profuſion of Blood may make a bandage neceſſary for the firſt few Days. They who are for the ſtrict bandage after dreſſing the Wound, faſten the Patient's Legs together at his Knees, leſt, by opening his Thighs, the Agglutination of the Wound might be impeded. But they who follow the laſt Method are in my Judgment moſt in the right, who apply ſuch a bandage the ſecond or third Day after the Operation, leſt any Gravel, concreted Blood, or Fragments of the Stone, being retained in the Bladder, might prove a baſis for the Formation of more Stones.

Manner of Dreſſing after the Operation.

XIII. After the Dreſſing, the Patient ſhould be ſupplied with Plenty of Ptiſan, *Decoctum Hordei*, a ſtrengthning Emulſion, and a quieting Draught; not ſo much to compoſe him to ſleep, as to recover his Strength, and to cleanſe or waſh out what Relics of the Stone, Gravel, or concreted Blood may remain in his Blad-

Regimen after the Dreſſing.

[a] COLOTUS (*Lib. de Lithotomia*, pag. 131.) relates, that he ſtopt an Hæmorrhage of this kind, that would yield to no other Means, by repeated Phlebotomy, to the Number of three times within the ſpace of Four and Twenty Hours: He alſo adviſes Phlebotomy in ſuch Caſes to be continued *ad Deliquium Animi.*

der. His Diet ſhould be ordered the ſame as uſual for People in Fevers, or that have ſuſtained great Wounds; that is, to order him in the Beginning a Ptiſan, or *Decoctum Hordei*, made pleaſant with ſome cooling Syrup, for his ordinary Drink; and afterwards, if no Fever comes on, or if it is over, he may be permitted to drink ſmall Ale, or rather Wine well diluted with Water, at the ſame Time ſtudiouſly avoiding every thing ſalt or ſharp, ſpicy, or too much heating the Blood. The Air of the Patient's Bed-chamber ſhould be neither hot nor cold, but as temperate as poſſible. If the Patient ſhould complain of an unuſual Heat and ſlight Fever, ſome Blood ſhould be taken from him, a Gliſter adminiſtred, and cooling Medicines taken inwardly. Theſe Difficulties being ſurmounted, we may judge the Patient to be in a fair Way, and have great Reaſon to expect a Cure. But if, on the contrary, a cold Chill and Horror ſeizes the Patient on the third, fourth, or fifth Day, follow'd by an intenſe Fever, Nauſea, Vomiting, Hiccoughs, and convulſive Motions, or if the Wound does not kindly ſuppurate, but becomes dry, we may thence be generally pretty certain that Death will follow. At firſt the Wound may be dreſſed once or twice in a Day with ſcraped Lint, and ſome digeſtive Unguent, as is uſual in other Wounds; and over the ſcraped Lint ſhould be applied, and ſecured by Bandage, a large Compreſs dipt in warm Spirit of Wine, Oxycrate, or ſome proper Fomentation, to prevent an Inflammation of the Parts. After the third or fourth Day the Surgeon may in my Opinion ſafely venture to tighten the Bandage, and retain the Parts a little cloſer together, which ſhould be done gradually one Day after another; and, after a good Suppuration and Union of the Parts has ſucceeded, the Wound may be dreſſed with ſome vulnerary Balſam, ſuch as the *Balſ. Capaiv.* and Liniment *Arcei*, made very warm, and applied with ſcraped Lint inſtead of the digeſtive Ointment uſed before, ſecuring the whole dreſſing carefully with ſome ſticking Plaſter, and Compreſſes on each Side. This way of dreſſing ſhould be continued twice a Day, till the Lips of the Wound are united, after which a good Cicatrix may be procured, by dreſſing once in a Day with dry Lint only, applying an Emplaſter over it. The Agglutination of the Wound may be alſo much promoted by the Patient's keeping his Thighs cloſe together, and by lying as much as poſſible on his right Side as is cuſtomary. This being obſerved for ſome Time, the Patient may then turn himſelf, and lie on either Side, or on his Back, at Pleaſure, provided he lies ſtill, and keeps his Thighs cloſe together; to do which the better and more effectually, it is often neceſſary, eſpecially in Children, to bind the Thighs cloſe to each other, and command them to keep ſtill in the Bed. Nor ought the Patient to be ſuffered to riſe, and walk about before the Urine diſcharges itſelf all by the common and natural Paſſage of the Urethra, and that the greateſt Part of the Wound is healed up, as before; which is ſometimes performed within the ſpace of eight Days in Children, where the Stone has not been large and difficult to extract. Afterwards, walking may be ſo far from hindering the Urine from diſcharging itſelf the right Way, that it may ſometimes promote the ſame, and not indiſpoſe the Wound for healing. Nor will it be improper for the Surgeon to compreſs the Wound with his Hand, about ſix or ſeven Days after the Operation, in order to ſee if the Urine will diſcharge itſelf by the natural Paſſage of the Urethra, if it does not take that Courſe of its own Accord. As often as the Linen is made wet and foul with the Patient's Urine, it ſhould be changed

changed for clean, if poſſible, to prevent an Ulceration of the adjacent Parts.

XIV. Laſtly, I ſhall conclude upon this Method, by propoſing a few Cautions for the ſake of Beginners, which are very neceſſary to be known and obſerved: And firſt, if when the Operation has been performed, the Stone cannot be found after long ſearching, or if, upon any other Account, it cannot be extracted, the Patient being at the ſame Time very weak, the Surgeon ſhould then deſiſt a while, that the Patient may have Opportunity to recover his Forces, and in the mean time he ſhould have ſome corroborating Medicines given to him. But when the Patient is extremely weak, or a Delirium and Convulſions come upon him, he ſhould then be put to Bed for a Day or two, or longer, even till the Wound ſuppurates; and the Operation ſhould be deferr'd, till the Patient recovers Strength, and the Stone may be felt by the Probe, according to the Advice of ALBUCASIS, FRANCUS [a], HILDANUS [b], COLOT [c], SAVIARD [d], and others; for the Patient ought never to be held upon the Table longer than his Strength will permit, leſt he ſhould periſh under the Surgeon's Hand; but when he is pretty well recovered, the Operation may be again renewed. Sometimes a corrupt, ſpongy, or fleſhy Subſtance is extracted together with the Stone, which is then a Sign of ſome Abſceſs, Caruncle, or fleſhy Excreſcence formed within the Bladder. If the Catheter cannot be paſſed into the Bladder of an Adult, who has preſumed to undergo the Operation, from whatever Cauſe it may proceed, whether an Inflammation in the Neck of the Bladder, a Caruncle, violent Phimoſis, or a Stone impacted into the Neck of the Bladder; in ſuch a Caſe the Operation ought either to be performed according to the old Method, by the Apparatus Minor, cutting upon the Fingers, or elſe, according to PETER FRANCUS, to make the Inciſion above the *Oſſa pubis*, as we ſhall hereafter direct more at large. If a Prolapſion of the *Anus* or *Rectum* ſhould be occaſioned from the Strainings cauſed by the violent Pain of the Stone, in the Beginning of the Operation, as it often happens, it may be again replaced by the Finger after the Operation is finiſhed, if it be inconſiderable; but if the Prolapſion be great, the Inteſtine ſhould be immediately replaced, and ſuſtained by an Aſſiſtant with a Compreſs, to prevent its being wounded. But if this Accident ſhould happen in the middle, or towards the End of the Operation, the replacing of the Inteſtine may be deferred till the Operation is over; when, upon a Ceſſation of the Pain, it uſually recovers its own proper Situation, which may be otherwiſe aſſiſted with the Fingers. If the Operation is to be performed upon one who has been cut before, then the Inciſion is to be made directly in the old Wound, or Cicatrix. Nor ſhould the external Wound be ever made too ſmall, leſt the Extraction of the Stone ſhould be thereby rendered difficult; eſpecially as we are aſſured from Experience, that a large Inciſion heals as ſoon, and as kindly, as one that is ſmaller [e]. But when the Stone is impeded in its Extraction by the opening being too ſmall, the Wound ſhould be enlarged in the moſt convenient Part of it, either by the Knife or Sciſſors: But if notwithſtanding the Stone proves too large to be ex-

Cautions.

[a] Lib. de Herniis. [b] Lib de Lithotomia, *Cap.* XV. [c] Lib de Lithotom. *pag.* 182, 188. [d] Obſervat. Chirurg. *pag.* 206.

[e] The making a large Inciſion was alſo approved of by CELSUS, ALBUCASIS, ÆGINETA, and others of the Ancients before the Moderns.

tracted, 'tis much better to deſiſt, than to kill the Patient by too violent a Treatment. If the crooked Forceps are to be introduced into the Bladder, it ſhould be with the End of them pointing upwards; tho' the ſtraight Forceps will generally ſuffice. Inſtead of the common Biſtorry (*Tab.* XXVII.) thoſe may be alſo uſed to Advantage, which are repreſented in *Tab.* XXXI, *Fig.* 8. and 18. The Time in which the Wound heals, after the Operation, is various, being ſometimes within the ſpace of fifteen or twenty Days, and ſometimes four or five Weeks, according to the Patient's Habit, and other Circumſtances. When the Forceps of any kind are introduced into the Bladder, it ſhould be done with the Direction of the Finger, the Conductor, or the Handle of the Scoop which has a Button; leſt, by miſtaking their Way, they might injure the Bladder, and Parts adjacent. If the Stone appears to be flat or plain, it ſhould be rather taken hold of by the Forceps in its upper and lower Part, than by its Sides. Laſtly, if the Patient ſhould be afflicted with violent Pains in his Bladder after the Operation is finiſhed; it will be convenient to inject ſome warm Milk, or other Decoction thro' the Wound by a Syringe into the Bladder. But if the Injury may be reaſonably ſuppoſed to proceed from the Roughneſs or Largeneſs of the Stone contuſing the Bladder; it may then be proper to fill the Bladder with *Aq. Hordei*, or a Decoction of ſome vulnerary Herbs, made warm, and mixed with ſome *mel roſar.* or elſe warm French Wine, in which Myrrh has been boiled, with the Addition of ſome *mel roſar.* For the reſt, I would adviſe the Surgeon not only to conſult TOLET, GREENFIELD, ALGHISH, and other Writers, before he undertakes the Operation; but alſo to call in the Advice of ſome prudent Phyſician. For the Conveniency and Advantage of this Method of Lithotomy above the reſt, the Reader may peruſe LE DRAN's *Parallele des Methods*, &c. On the contrary, this Method is rejected by GARENGEOT *(in Oper. Chirurg.)* and DENYS *(in Obſerv. Chirurg.)* as it alſo was before them by DOUGLAS in his Treatiſe of the High and Lateral Operation, as alſo by CHESELDEN and MORAND, where they treat on this Method.

An EXPLANATION *of the* TWENTY NINTH PLATE.

Fig. 1. Repreſents the *Urethra* of a Male Subject (freed from the other Parts of the *Penis*) together with the Bladder, proſtrate Gland, and *inteſtinum Rectum*, all view'd on their left Side, and figured as much as poſſible to the Life, ſo as to exhibit the natural Diſpoſition of them, as they appeared in a Lad of fourteen Years of Age. A the Glans Penis, B C D E F the Urethra in its natural curve Poſition, E the Bulb of the Urethra, F a Part of the Urethra, termed membranous, G the Body of the Bladder itſelf, H its *Fundus* or Bottom, I K L the Neck, or Entrance of the Bladder, inveſted with the proſtrate Gland, and denudated of its muſcular Fibres, which compoſe the *Sphincter veſicæ*, to render it more conſpicuous, I is the Beginning or *Apex* of the Gland, K the Body of it, L its Extremity, or Margin next the Bladder; M N denote the *Fundus*, or lower Part of the Bladder next the *Inteſtinum Rectum*, in which is formed the left *Sinus*, or Cavity, which often impreſſes itſelf into the Rectum, ſo as to conceal or intercept the Stone; N O P denote the Back Part of the Bladder, which lies next to the *Os ſacrum*, and Cavity of the

Fig. 1.

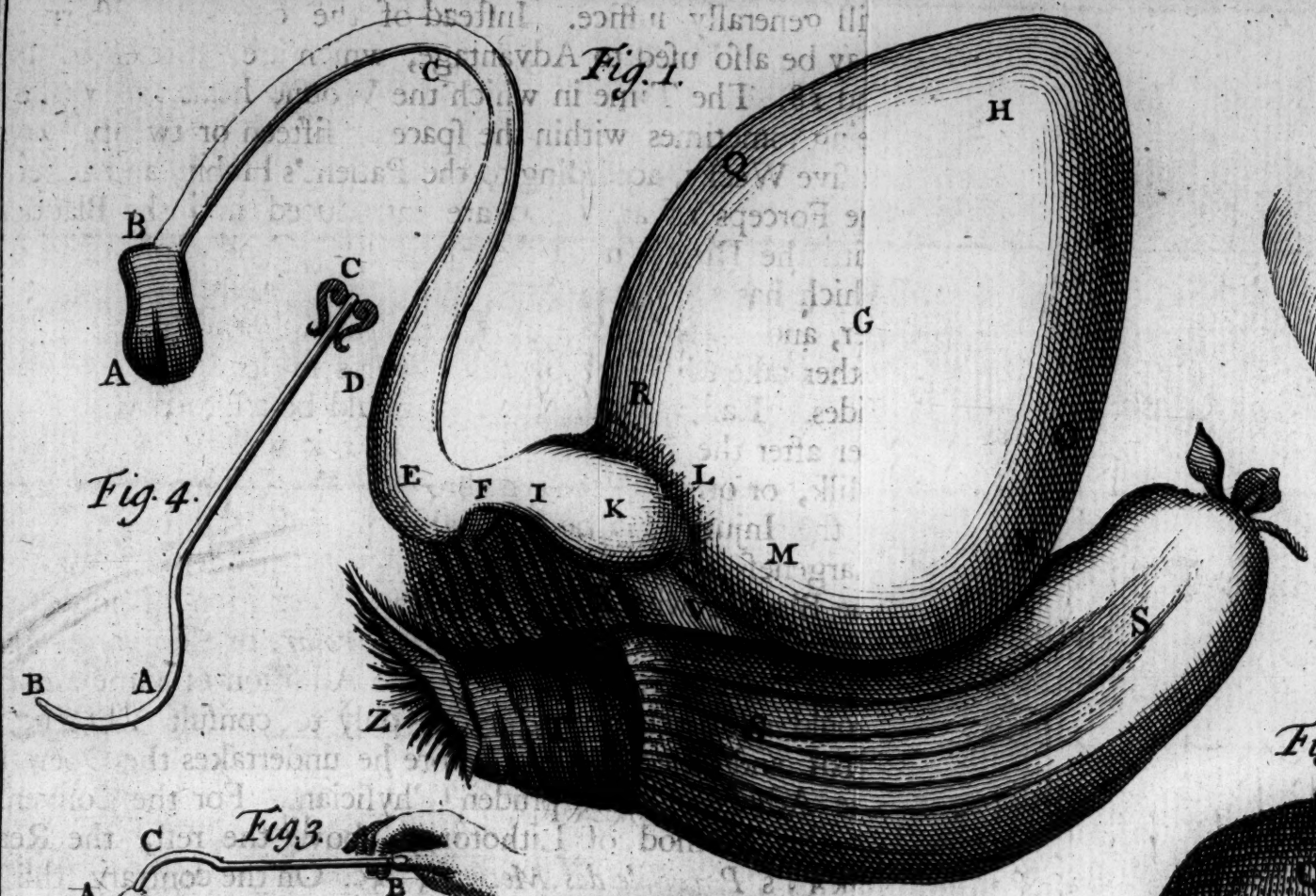


Fig. 4.

Fig. 8.

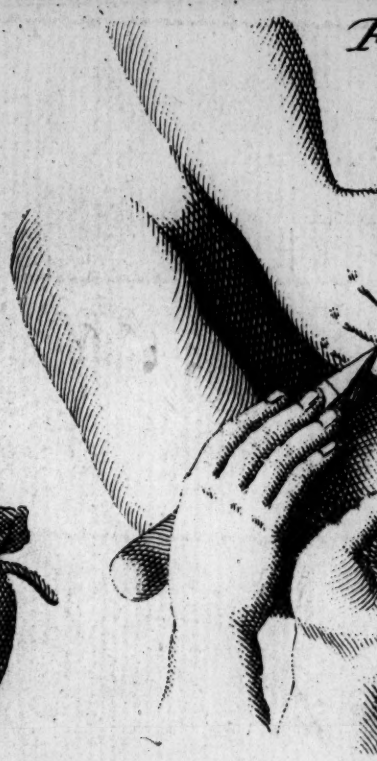


Fig. 3.

Fig. 2.

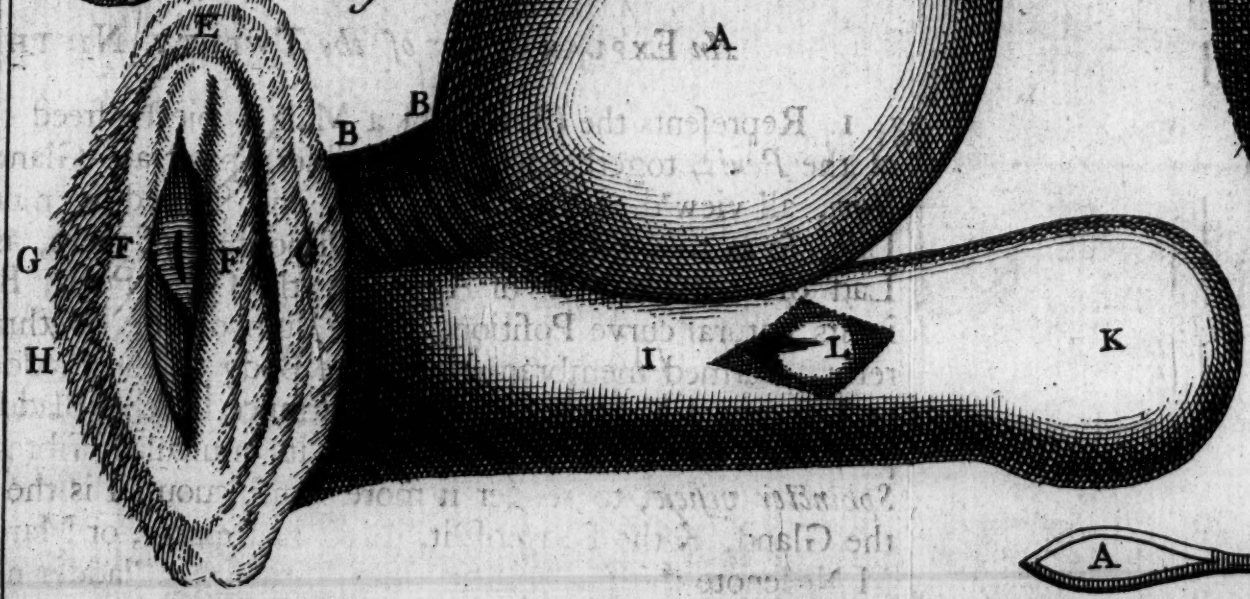


Fig. 5.

Fig. 6.

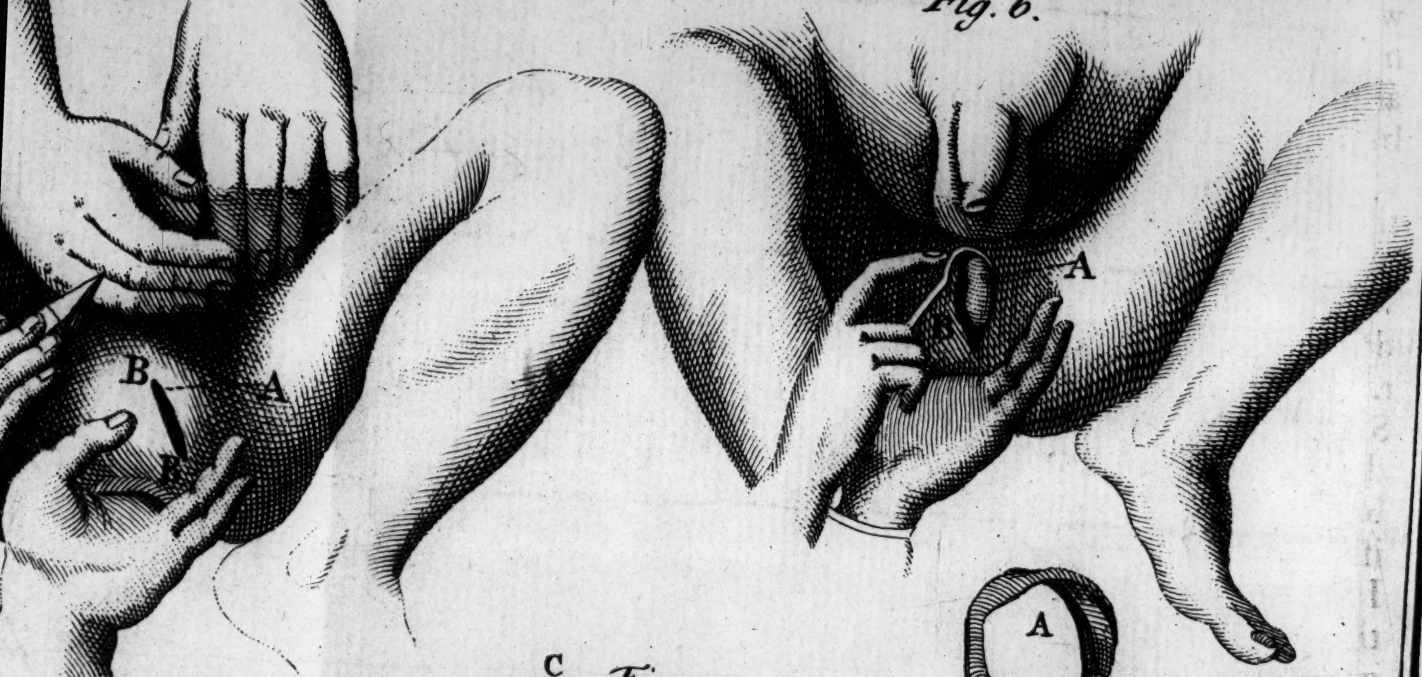


Fig. 9.

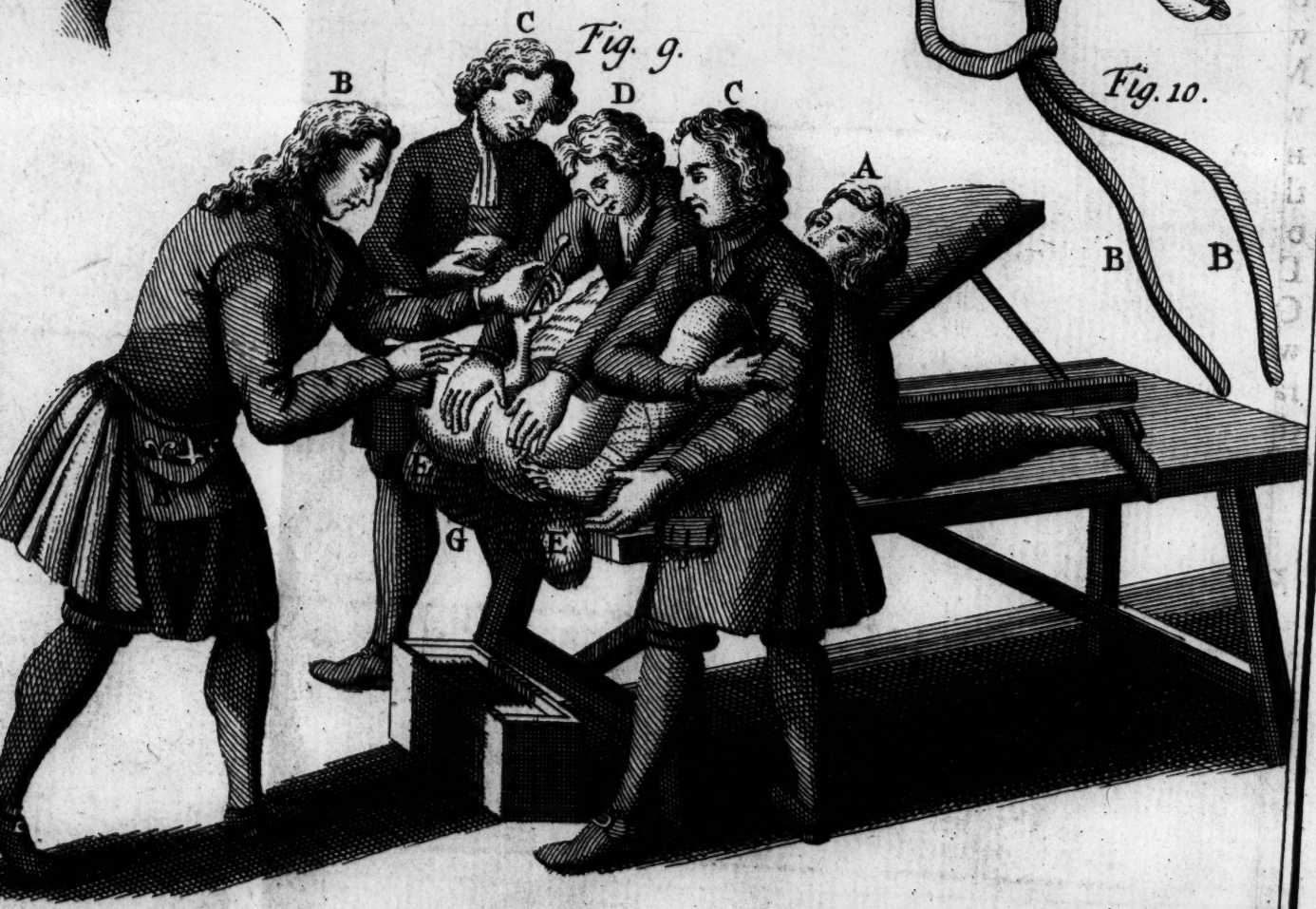


Fig. 10.

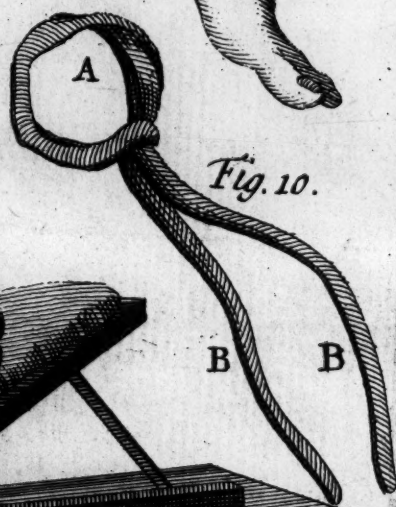


Fig. 7.

J. Mynde sc.

the Abdomen, being covered with the Peritonæum; Q R is the anterior Part of the Bladder in our erect Poſition, but the uppermoſt when we lie down; 'tis this Part which is divided in the high Operation, being not inveſted with the internal Lamen of the Peritonæum, but quite free and excluded from the internal Cavity of the Abdomen; whereas the Parts of the Bladder marked N O P H Q are immediately inveſted with the Coat of the Peritonæum, and lie next the Cavity of the Abdomen, as may be plainly perceived by inflating or injecting ſome Liquor into the Bladder of a dead Subject; but, concerning this, we ſhall be more particular in our Explanation of the ſucceeding Table. S S denote the *Inteſtinum Rectum* connected to the Bladder; T the *Sphincter Ani*, or Muſcle deſtined to cloſe the Mouth of the *Rectum*; V is Part of the left ſeminal Veſicle; X X the Interſtice betwixt the *Inteſtinum Rectum*, Bulb of the Urethra, and Neck of the Bladder, filled partly with the *Membrana adipoſa*, and in Part compoſed of muſcular Fibres detached from the Sphincter and elevating Muſcles of the *Anus*.

Fig. 2. Repreſents the Poſition of the Bladder and *Urethra* in Women, as they are ſeen on the left Side, together with their Connection to the *Uterus* and *Vagina*, taken from ALGHISH. A denotes the Bladder, B B its Sphincter Muſcle, including the *Urethra* marked C C. D the external Mouth or Entrance of the *Urethra* at the *Vagina*. E the *Clitoris* and its *præputium*; F F the *Nymphæ*, G G the *Labia pudendi*; H the *Os uteri externum*, or Entrance of the *Vagina*; I I the Body of the *Vagina*; K the *Uterus* itſelf; L the *Os Tincæ*, or internal Mouth of the *Uterus* ſeen thro' a lateral Slit made in the *Vagina*.

Fig. 3. Shews the Manner in which the Catheter is to be introduced into the Urethra, and afterwards paſſed into the Bladder. A denotes the Surgeon's left Hand elevating the Penis, B his right Hand thruſting the Catheter into the Urethra, in ſuch a manner that the convex Part of the Catheter looks towards the Back of the Penis, and the Abdomen.

Fig. 4. Denotes the Poſition into which the Catheter is to be turned in the Urethra, when it has reached the Bulb of the Urethra marked E in *Fig.* 1. it is to be then inverted, ſo that the concave Part of the Inſtrument may be next the Abdomen, and the Extremity of it, marked B, gradually inſinuated thro' the Neck of the Bladder into its Cavity. C denotes the Handle of the Catheter by which it is to be guided in paſſing it.

Fig. 5. Exhibits the ancient Method of Lithotomy deſcribed by CELSUS, performed by introducing the two fore Fingers into the *Anus*, whereby the Stone and Neck of the Bladder are thruſt outward in the *Perinæum*, and the Inciſion B B is then made upon the Stone in the moſt prominent Part of the *Perinæum* marked A. The Figure is taken from TOLET's Treatiſe on Lithotomy; but the Place and Figure of the Inciſion is added by myſelf.

Fig. 6. Shews the Method of extracting the Stone marked A, by the Hook B, when it ſticks in the Wound, ſo as not to be extricable by the Forceps or Fingers, taken alſo from TOLET.

Fig. 7. Is a Braſs Inſtrument of MARINUS, adapted to extract Stones out of the Urethra. A that Part of the Inſtrument which is to be inſinuated into the *Urethra* behind the Calculus; B the round Ring or Handle by which the Inſtrument and Calculus are to be then drawn out of the *Urethra*.

Fig.

Fig. 8. Repreſents an anterior View of the Bladder taken out of a Lad. A A denote the Neck of the Bladder, and Beginning of the Urethra. B B the Body of the Bladder, C its *Fundus* with the adjacent Part of the *Urachus*, D D the proſtrate Gland inveſting the Urethra, E E the ſeminal Veſicles, in Part viſible on each Side, which in Adults are more protuberant, and extended up to F F; where being hollow internally, there is a Sort of *Sinus* formed in the Bladder on each Side, in which the Stone often lies concealed; they may be therefore not improperly called the *Sinus's* of the Bladder, which are yet wanting in the Bladders of Infants and Children; the Figure of the Bladder in Adults is therefore ſomewhat different from that in Children. The Bladder indeed reſembles the Form of a Pear in both of them; but with this Difference, that in Children the Apex of the Pear is downwards toward the Urethra, as in this Figure; but in Adults the Apex of the Pear is upwards, the Bladder being broadeſt downward in them, as may be ſeen in *Fig.* 1. of this Table, and in *Fig.* 1. and 2. of *Tab.* XXXII.

Fig. 9. Repreſents the Manner in which the adult Patient ſhould be placed and held for Lithotomy, according to ALGHISH; which is in part different from the Method of TOLET, and other modern Operators. A denotes the Poſture of the Patient, and B the Surgeon, as he holds the Catheter in his left Hand, and the Inciſion-Knife in his Right. C C two of the Aſſiſtants, who are placed on each Side of the Table, to ſecure the Patient's Limbs, holding the Foot in one Hand, and the Knee in his other; D the Aſſiſtant who kneels upon the Table, and by ſtriding over the Patient, keeps his Body from riſing or moving, while with his Hands he draws up the Scrotum, and extends the Skin of the Perinæum; E E a Cuſhion placed under the Patient; F a Veſſel placed beneath the Patient to receive the Blood, and perhaps the Fæces, diſcharged in the Operation; G denotes the Part of the Perinæum in which the Inciſion is to be made. H the Caſe or Pouch for containing the Inſtruments, to be faſtened about the Waiſt of the Operator; this is repreſented by itſelf in *Tab.* XXX. *Fig.* 6.

Fig. 10. Exhibits one of the open Ligatures with which RAVIUS uſed to faſten the Patient's Hands and Legs together. A the Loop for containing the Wriſt, B B its two looſe Ends to be faſtened round the Leg, of which ſee more hereafter.

CHAP. CXLII.

Of Lithotomy by the Apparatus Altus, *or the high Operation of* PETER FRANCUS, *whereby the Stone is extracted by an Inciſion in the Hypogaſtrick Region, above the* Oſſa pubis.

The Origin and Hiſtory of this Method.

I. BEſides the two preceding Methods of Lithotomy by the *Apparatus Major* and *Minor*, practiſed by our modern Surgeons, we alſo meet with a third Method propoſed and deſcribed in their Chirurgical Writings, which is aſcribed to one PETER FRANCUS, a French Surgeon, as its firſt Inventor, after whom it has been denominated *Methodus Franconica*, and from the Place of Inciſion

Inciſion being in the middle of the *Hypogaſtrium*, it has been alſo termed the *Hypogaſtric Section*, and commonly the *Apparatus Altus*, becauſe the Operation is performed above the *Oſſa pubis* in the ſuperior and anterior Part of the Bladder; whereas in the *Apparatus Major*, *Minor*, and the Lateral Operation the Inciſion is made beneath the *Scrotum* in the *Perinæum*. However, this new Method of Lithotomy was hardly ever once performed by its Inventor, but it was as quickly expunged the Practice of Surgery, and hardly ever mentioned in the Schools, but with a View to explode it. And notwithſtanding its firſt Author performed the Operation with Succeſs upon a Lad of two Years old, at *Lauſanne* in *Switzerland*, Ann. 1560, it was becauſe he was obliged to it from the Stone being as big as a Hen's Egg, too large to be extracted at the *Perinæum* [a]. And tho' he undertook the Operation by the Intreaty of the Parents, and happened to ſucceed therein, he thinks the Succeſs ought to be attributed rather to Accident than Art; he is alſo ſo far from recommending this Method of Lithotomy, either to the Patient or Surgeon, that he pronounces it to be extremely dangerous to the Patient, and a raſh Undertaking in the Surgeon; and this was inſiſted upon the more at that Time of Day, becauſe a Wound in the upper or membranous Part of the Bladder had been always judged by the Ancients, after HIPPOCRATES [b], to be mortal. But from that Time there have been ſeveral of the more prudent Phyſicians and Surgeons, [c] who were led to think, from the anatomical Structure of the Parts, joined with Examples of Succeſs in Practice, that the Method of Cutting for the Stone above the *Oſſa pubis*, might be both ſafe, eaſy and expeditious to one acquainted with the true Situation of the Bladder without-ſide the *Peritonæum*, together with its Conformation and Connexion to the adjacent Parts, as alſo with the Method of Cutting into the Bladder without injuring its Fundus. That it was poſſible for the high Operation to be performed with Succeſs, might appear from the Inſtance of its accidental Author, PETER FRANCUS, who firſt led the Way to it, as we before obſerved, without any bad Event: TOLET alſo informs us (*Chap.* 13.) that BONNETUS, a celebrated Surgeon and Lithotomiſt formerly at *Paris*, uſed to perform the high Operation there to good purpoſe. The Method of performing Lithotomy by the *Apparatus altus* deſcribed by TOLET, almoſt in the manner it is propoſed by FRANCUS, take as follows, *viz.* ſome Aſſiſtant is to introduce his two fore Fingers into the Patient's Anus, to protrude the Stone forwards, and towards the upper Part of the Bladder, and to hold it there; in the mean time the Lithotomiſt makes an Inciſion ſucceſſively thro' the Skin, Fat, Muſcles, and Bladder itſelf, near the *Linea Alba*, a little above the *Oſſa pubis*; and having found the Stone, after dilating the Wound with a proper Inſtrument or Dilator, he then extracts it by the Forceps, and afterwards endeavours to heal the Wound by treating it with vulnerary Balſams, according

[a] See his Book entitled, *Traité des Hernies*, Cap. 33. p. m. 139, 140.
[b] Aphor. 18. Sect. VI. and CELSUS *Lib.* VII. *Cap.* 26.
[c] As ROSSETUS de partu Cæſar. *Cap.* VII. HILDANUS, Lib. de Lithot. in Operib. p. m. 732. & ſeq. NIC. PIETREUS in Quæſt. Med. An extrahendum calculum diſſecando ad pubem Veſica. Edit. *Pariſ.* 1635. TOLET, Treatiſe of Lithotomy, *Chap.* 13. SOLINGEN, Operat. Chirurg. PROBY in Philoſ. Tranſact. Ann. 1700. & Act. Erud. Lipſ. An. 1701. pag. 230. DIONIS Chirurgical. Operat. Demonſtrat. III. on Lithotomy. GREENFIELD on the Stone and Gravel, *Lond.* 1710. *pag.* 152. GARENGEOT Chirurg. Operat. Edit. I. Tom I. *pag.* 358. PATIN apud Barth. Cent. IV. Epiſt. 20, 21. An. 1660.

to

to the general Practice in treating Wounds of the Abdomen. But as for filling the Bladder firſt with Water, or ſome other proper Liquor, TOLET takes no Notice thereof, notwithſtanding it had been long before propoſed by ROSSETUS. To FRANCUS and BONNETUS we ought to add GREENFIELD as a Practitioner of the *Apparatus Altus*; for in his Treatiſe on the Stone (*Pag.* 152.) he relates that he was obliged to extract a Stone in this Method, by making an Inciſion above the *Oſſa pubis*, which happily ſucceeded; but what was the Reaſon that obliged him to this Practice, he does not inform us, though it might be probably becauſe the Stone could not be extracted at the *Perinæum*. And tho' HILDANUS firſt of all diſſwades from this Method of Cutting in general, yet he afterwards writes [a], if the Stone ſhould be of an exceeding great Size, *&c.* I ſhould then rather prefer the Method of PETER FRANCUS before the *Apparatus Major*; for if the Stone, by Reaſon of its Largeneſs, be preſſed towards the *Inguen*, (he would, or ought to ſay, the *Pubis*) I am perſwaded that it may be extracted with leſs Pain and Danger at the *Pubis*, than to force it thro' the Neck of the Bladder. But if a large Stone may this Way be more commodiouſly extracted, than by the *Apparatus Major*, as HILDANUS thinks and acknowledges, certainly a ſmall Stone may be extracted by Skill with much more Eaſe, and leſs Pain and Danger. The high Operation is alſo much recommended by PIETREUS, and the great *French* Anatomiſt RIOLAN (*in Anthropograph.* Cap. 28.) evidently proves the Operation to be practicable from the Situation and Structure of the Bladder, and tells us of its being performed within his Knowledge. Alſo DIONIS, one of the moſt eminent modern Chirurgical Writers in *France*, does, for the ſame Reaſons, think, that this Method may be not only practiſed with Succeſs; but when the Bladder has been previouſly filled with ſome warm Liquor, he thinks it preferable both to the *Apparatus Major* and *Minor*, if it were but brought more into Uſe; and he aſſerts that M. FAGON, at that Time firſt Phyſician to the King of *France*, was alſo of the ſame Opinion. Whence it appears, that many of the *French* have frequently wrote and contended for this Method of Lithotomy. We have alſo a remarkable Example of a Stone extracted with Succeſs from a Maid by the high Operation, deſcribed in the *Philoſ. Tranſact.* of the Royal Society *Ann.* 1700. *pag.* 455, by one Mr. PROBY, a Surgeon, which I ſhall conſider more particularly when I come to treat of the Methods for extracting the Stone from Women. But this I am a little ſurprized at, that none of the many *Engliſh* Lithotomiſts who have wrote on this Method, ſhould not ſo much as mention this Inſtance, which one would be therefore apt to think was unknown to them, notwithſtanding it was made public in the foreſaid *Tranſactions*, and in the two *German* Editions of my Surgery, Ann. 1724. Nor have any of the *French* Writers on this Subject taken any Notice of this remarkable Inſtance, except M. FALCONET [b], a Phyſician of *Paris*. The Caſe being thus, it ſeems to me not a little extraordinary, that ſo many eminent Surgeons and Lithotomiſts of the *French*, ſhould abſolutely reject and treat this new and more ſimple Method with Neglect, when it had

[a] Lib. de Lithotomia in Oper. Chirurg. p. m. 732, 733. But he there wrongly calls it *Sectio Inguinalis*; becauſe the Inciſion is not made in the *Inguen*, but in the *Hypogaſtrium*, above the *Oſſa pubis*, whence it is alſo termed *Sectio Hypogaſtrica*.

[b] In Quæſtione Medico-Chirurgica, An educendo calculo, ceteris anteferendus ſit apparatus Lateralis? Edita Pariſiis *Ann.* 1730. *pag.* 6.

been

been ſeveral Times performed with Succeſs [a]; nay, it even appears on many Accounts to be much more eaſy, ſimple and obnoxious to fewer Inconveniencies than the other Methods; the high Operation is not attended with the Dangers of wounding the Parts ſubſervient to Generation, or for diſcharging the Urine, as the Urethra, Sphincter of the Bladder, Ureter, nor Inteſtinum Rectum; nor are any of the larger Blood-veſſels in Danger of being this Way wounded, nor is this Method afterwards attended with a *Fiſtula in Perinæo*, an Incontinency of the Urine, or Impotency and Weakneſs from too great an Hæmorrhage; which Advantages, with other Conveniences, are exhibited at large by Rosse-tus, in his Treatiſe *de Partu Cæſareo*, where he greatly recommends the high Operation, and demonſtrates that the Inciſion made this Way into the Bladder, if it did not communicate with the Cavity of the Abdomen, ſo as to tranſmit the Urine into the ſame, is by no means mortal.

II. In Conſideration of the fore-mentioned Advantages, joined with many weighty Reaſons, this Method of extracting the Stone, according to Peter Francus, above the *Oſſa pubis*, was induſtriouſly revived by the learned Phyſician, Dr. James Douglas, after it had been almoſt buried in Oblivion; for he, partly by reaſoning from the Situation, Structure, and Connection of the Bladder, and partly from the Authorities of others who had wrote on the Subject, demonſtrated, with the Conſent of the Royal Society, *Anno* 1718, that the Stone may be ſafely extracted by cutting into the upper and anterior Part of the Body of the Bladder, when the Inciſion is ſkilfully performed; and accordingly in the Year following, 1719, his Brother, John Douglas the Surgeon, performed the Operation on a Man afflicted with the Stone, after which he publiſhed in the Year following, 1720, a Treatiſe on the Subject, intitled *Lithotomia Douglaſiana*, in which he not only confirms the Reaſonableneſs of the Method by Arguments taken chiefly from Anatomy, but alſo relates the ſeveral Advantages of this new Method of Lithotomy, beyond thoſe commonly practiſed, and, what is more, confirms the whole by a remarkable Inſtance of his performing the Operation ſucceſsfully upon a Lad of ſixteen Years of Age, which was done at the Time when he firſt publickly propoſed this Method of Cutting for the Stone [b]. Soon after this, the high Operation was frequently practiſed with Succeſs by Douglas, Cheselden, and other Surgeons of the *Engliſh*, as I had Intelligence from ſome of my Friends then dwelling at *London*, and was ſoon after informed by the Treatiſes publiſhed on the Subject. The chief of which were Mr. W. Cheselden's *Treatiſe on the High Operation for the Stone*, Lond. 1723, 8*vo*. *Cyſtotomia Hypogaſtrica*, Anonymus, Lond. 1724, 4*to*. *An Eſſay on Lithotomy by Dr.* Middleton, 4*to*. Lond. 1727. *Traité de la Taille au haut Appareil, de M.* Morand, Paris 1728. and Douglas's *Diſſertation on the High Operation*, Lond. 1729. In which he reckons up ſixty

Revived by Douglas.

[a] Garengeot relates, in his Chapter of high Operation, that one of the beſt *Paris* Lithotomiſts, M. Thibaut, would never perform this Method on a living Subject, tho' he was acquainted with the Advantages of it. But the Queſtion might be alſo put to himſelf, why he never performd the ſame?

[b] The Celebrated Phyſician Dr. Martin Lister affirms, in his Journey to *Paris*, publiſhed at *London* in 1699. p. m. 238. that he formerly made Propoſals to the Royal Society for eſtabliſhing this Method of Lithotomy; but as he does not refer to the particular Part of the Tranſactions, I could never find the Paſſage; however, ſhould the Method be at any time reſtored to Practice, it muſt certainy reflect an Honour to his Name.

ſeveral Patients that had been cut in this Method by different Hands, the greateſt Part of them ſurviving.

When, and with what Succeſs I my ſelf performed this Operation.

III. For my own Part, as this new Method of Lithotomy appeared to be ſupported by anatomical Reaſons, profeſſed with ſufficient Weight and Evidence by ROSSETUS, DIONIS, and DOUGLAS; and finding it anſwer to Experiments often made by myſelf on dead Subjects, and by DOUGLAS, CHESELDEN, and other *Engliſh* Surgeons, upon living Subjects, this prevailed with me in a Caſe of Neceſſity to follow the Example of FRANCUS and GREENFIELD in the Year 1723, *April* 17. at which Time I performed the High Operation without any Fear, upon a Man upwards of thirty Years of Age, at *Helmſtadt*, in a Caſe where I could not extract a large Piece of the Stone by the Wound *in Perinæo*, according to the Method of RAVIUS, (which was ſometimes uſed by me, perhaps before any Body beſides its Author;) for the Fragment of the Stone could not be laid hold of, and conſequently not extracted by the Forceps, becauſe it lay concealed in ſome Sinus or Cavity in the Bladder, ſuch as are ſometimes obſerved by Lithotomiſts. See *Tab.* XXXII. *Fig.* 1. & 2. This I did in the preſence of many Surgeons and Students in Phyſic, the Day after I had performed the other Method of Lithotomy without Succeſs. Nor did I in this Caſe make any previous Diſtenſion of the Bladder by injecting ſome Liquor, for that was prevented by the Wound already made *in Perinæo*; but making an Inciſion into the Body of the Bladder at the *Ductus Roſſeti & Douglaſſii* above the *Oſſa pubis*, I then enlarged it both upward and downward by the crooked Scalpel armed with a Button at the Point (*Tab.* V. *Fig.* 5.) and introducing my Fingers, I extracted the Stone with great Eaſe and Expedition[a]. The miſerable Patient thus willingly endured the Operation, being rather deſirous to ſuffer Death, than to be perpetually tortured with the excruciating Pains of the Stone for the future. The Patient continued very well for the firſt three or four Days after the Operation, but about the fifth or ſixth Day he was taken with a cold Fit, followed by a feveriſh Heat, which being mitigated by the Uſe of proper Medicines, he was yet ſtrangely afflicted with Pains in his Back and Loins, attended with Sickneſs at his Stomach and Faintneſs, which he had been alſo troubled with oftentimes before the Operation was performed. The Wound, both externally and internally, was not attended with any Pain; yet the Lips could not at all be brought to ſuppurate and unite[b], notwithſtanding I applied very good ſticking Plaſters, and the broad uniting Bandage, (*Tab.* V. *Fig.* 8.) to keep them together, as is uſual in other Wounds of the Abdomen; I alſo dreſſed with a very good vulnerary Balſam, with long and thick Compreſſes applied on each Side of the Wound, which however did not prevent the Urine from eſcaping thereby out of the Bladder; tho', at the ſame time, little or no Urine paſſed through the Wound *in Perinæo*, and none at all thro' the natural Paſſage of the Urethra. In about four Weeks Time, the Patient being exhauſt-

[a] ROSSETUS, DOUGLAS, CHESELDEN, MIDDLETON, MORAND, LE DRAN, GARENGEOT, and others, direct the Bladder to be filled with ſome Liquor previous to the High Operation; but FRANCUS, GREENFIELD, ROSSET, BERRIER, and this Inſtance of my own, demonſtrate, that the Operation may be ſucceſsfully performed without that Preparation.

[b] It is alſo an Obſervation made by DOUGLAS, and the other *Engliſh* Surgeons, that when the Wound could not be ſuppurated and cleanſed, it was impoſſible to recover the Patient.

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ed by great Weakneſs, Reachings, *&c.* died [a]: And upon opening his Body, the Wound of his Bladder made *in perinæo* appeared to divide Part of its Neck and Body, and the Wound made above for the high Operation, appeared right in all reſpects, without any Opening into the Abdomen, or Diviſion of the Peritonæum, nor was there any Blood or Urine found in the leaſt within the Cavity of the Abdomen. But the Kidneys were found greatly ulcerated, and wonderfully diſtended with a purulent Matter, which was the true Cauſe of the intenſe Pain in his Back and Loins, with the other Symptoms, and was apparently the Cauſe of his Death.

The firſt Difficulty attending this Method.

IV. But, to ſpeak my Mind freely, this firſt Specimen of my performing the high Operation, tho' it was done dextrouſly, and according to Art; yet it did not ſeem to turn out ſo advantageouſly as one would have imagined from the Repreſentations of Rossetus and Douglas, eſpecially with regard to the healing of the Wound, which, in my Opinion, will but difficultly ſucceed in this new Method, and that for ſeveral good Reaſons. For, as Anatomy demonſtrates, that the lower Part, or Neck of the Bladder, is armed with a ſtrong ſphincter Muſcle for its Contraction; and as the Urine does not naturally flow out of the Bladder and Urethra by its own Weight, without the Aſſiſtance of the contractive Force of the muſcular Coat, termed *detruſor*, we need not at all wonder that the Bladder, irritated by its urinous Contents, ſhould contract and expel that Excrement with more Eaſe thro' the divided Part of the Bladder above, which has no Muſcle for its Contraction, than thro' the natural Paſſage of the Neck of the Bladder, which is always contracted by a ſtrong Sphincter; ſo that from this continual Protruſion of the Urine thro' the Wound, its Agglutination muſt be greatly impeded. To this we may add, that the external Wound in the Abdomen is alſo no leſs difficult to heal or unite; becauſe the divided Lips are conſtantly drawn from each other, by the Contraction of the oblique and tranſverſe abdominal Muſcles, whereby they conſtantly recede from the *Linea alba* towards the *Oſſa ilia*.

A ſecond Difficulty.

V. Nor is the Agglutination of the Wound rendered difficult from the continual Diſtraction of its Lips barely, but alſo from the Dreſſings, and topical Application of the Medicines, being immediately ſpoiled, or rendered inefficacious, by the conſtant Efflux of the Urine. For tho' I took all poſſible Care of the Patient, which I cut by this Method, to renew the Dreſſings, and approximate the Lips of the Wound two or three Times every Day, treating the ſame with an exceeding good vulnerary Balſam, and long ſticking Plaſters almoſt ſufficient to cover the whole Abdomen, brought very cloſe to each other, toge-

[a] M. Winslow writes in a Letter upon the High Operation to M. Morand, dated *Paris* 1728, that the *Apparatus Altus* was firſt reſtored in *England* by Douglas, but in *France* by M. Morand, who firſt performed the Operation at *Paris* in 1727. But as I performed this Operation before M. Morand in 1723, I might poſſibly be the firſt both among the *French* and *Germans*, who undertook and deſcribed the High Operation; for I had given a full Account of the whole in the ſecond *German* Edition of my Surgery in the Year 1724; as I alſo had to Winslow himſelf, in a Letter dated *May* 14, 1723 from *Helmſtadt*, which makes me wonder, that none of the *French* or *Engliſh*, who have ſince wrote on the Operation, ſhould not take any Notice thereof, except Mr. John Douglas, in his Treatiſe on the *High Operatinn*, pag. 1d6 & 128, publiſhed *Anno* 1729, when at the ſame Time my Surgery was well known in moſt Parts of *Holland* and *Germany*, and had a Character given of it by Sermesius, a Phyſician at *Amſterdam*, in his *Dutch* Tranſlation of Douglas's Lithotomy.

ther with long and thick Compreſſes applied on each Side of the Wound, and ſecured by means of a very long and ſtrong uniting Bandage, yet all proved to no purpoſe; for the Plaſters, Compreſſes, and Bandage were all wetted and looſened by the Urine in a very ſhort Time after their Application, ſo that it was often neceſſary to repeat the Dreſſing many Times in a Day; but in the mean time the Agglutination of the Wound did not in the leaſt ſucceed. But leſt any-body ſhould think that we neglected any thing that might be uſeful or neceſſary towards the Agglutination of the Wound, it may be here proper to obſerve, that no-body has yet propoſed a better Courſe than that which was followed by us; for even DOUGLAS and GREENFIELD do not ſo much as mention a Word about the means of healing the Wound throughout their whole Treatiſes; but only tell us in general, that they cured their Patients in the the ſpace of four Weeks.

Healing of the Wound often extremely difficult.

VI. From what has been now ſaid, I think it plainly appears how much thoſe are miſtaken, who prefer this Method of Lithotomy beyond the reſt, on account that the Wound this Way made, is more eaſily and expeditiouſly to be healed. For, ſay they, the Urine will, from the Laws of Fluids, much more eaſily paſs thro' the Aperture in the lower Part of the Bladder than that above; and therefore the Fiſtula, which is ſo frequently cauſed by the conſtant Flux of Urine through the Wound *in perinæo*, will not be ſo likely to happen in the Wound made by the high Operation: But any judicious Perſon may perceive, that there is nothing at all in this, if he conſiders what we have but now ſaid of it. For as the Urine is expelled out of the Bladder, not by its own Weight, but by the proper Contraction of that membranous Receptacle, aſſiſted with the Preſſure of the Diaphragm and abdominal Muſcles, it muſt neceſſarily follow, that it will more eaſily diſcharge itſelf by that Preſſure thro' a Wound in the upper Part of the Bladder, where there is leſs Reſiſtance, than thro' the Neck of the Bladder, which is contracted with a ſtrong Sphincter Muſcle. And this ſeems in my Opinion to be the Reaſon, why ſo many Surgeons have neglected this new Method of Lithotomy; that tho' it has, in ſome Hands, ſeveral Times ſucceeded well, yet it is now laid aſide by almoſt univerſal Conſent. But the Reaſon why all of the ſtanding Surgeons, who have deſcribed the high Operation, have taken little or no Notice of the great Difficulty there is in healing the Wound, and ſay nothing of their Method of treating, it may be, from a Jealouſy of their Reputation, thinking it better to ſay nothing of the Matter, than to give the World an Opportunity of attributing their want of Succeſs to a want of Skill; for there are but very few Phyſicians, who, after the manner of HIPPOCRATES, or of myſelf, are free and open in declaring the Caſes in which they miſcarried, as well as thoſe in which they ſucceeded, in order to ſerve their Poſterity, in leaving them prudent Cautions. The generality indeed plead, with ſome Reaſon, that the imprudent and envious may from thence find Matter for Calumny and Diſgrace, by attributing the Death of a Patient to a wrong Treatment, when his Diſorder was in itſelf incurable. TOLET tells us, from the Relation of others, that BONNETUS performed the high Operation for the Stone on ſeveral Patients; but with what Succeſs, or with what Artifices the remaining Wound was afterwards healed, neither TOLET nor BONNETUS ſay a Word. But this we are aſſured of, that BONNETUS, and the major Part of the *French* Surgeons, have ever ſince neglected this Method, and cut their Patients

tients in the common Method by the *Apparatus Major*, which they continue to this Day, as we learn both from Hiſtory and Report. We may therefore reaſonably pronounce, that the high Operation was very ſeldom performed by BONNETUS, and perhaps never but when he could not treat the Patient, or extract the Stone by the common Apparatus [a]. It might ſeem detractory to the Character of an eminent Surgeon to confeſs, that a Wound, which had appeared before to be ſlight in the Judgment of others, could yet be not at all, or but very difficultly cured by him. But we may reaſonably conjecture, that neither BONNETUS, nor any other of the moſt celebrated *French* Surgeons, had any Reaſon to reject this new Method of Lithotomy, beſides that of the ill Condition of the Wound, indiſpoſing it to heal; ſince they allowed it to have the ſeveral Advantages (mentioned §. I.) over the other Methods. Some will perhaps reply, that DOUGLAS happily cured the Wound after he had performed the high Operation on a ſtout young Man, who had no large Stone; but we are not from hence to conclude univerſally, in different Habits and Circumſtances; for there is the ſame Neceſſity for performing this Operation on Patients advanced in Years, and of an ill Habit of Body, in which the Wound will not at all be diſpoſed to heal. I muſt therefore declare my Opinion, that I think it the Part of a prudent Surgeon, not to engage in the high Operation as the beſt Method of Lithotomy, 'till more ſpeedy and effectual Means ſhall have been diſcovered for conſolidating the Wound, and approved or confirmed by repeated Inſtances of Succeſs. As for M. TOLET's Opinion, that the Wound made in the high Operation might be as eaſily cured as other Wounds of the Abdomen, that ſeems to be a ſufficient Proof of his being unexperienced in this Affair, ſpeaking merely by Conjecture. Laſtly, whether *Gaſtroraphia* may be practiſed with Succeſs in this Operation, as it is recommended by ROSSETUS and SOLINGEN, I am yet doubtful; ſince the Puncturation of the Bladder in that Operation eaſily excites bad Symptoms, and as ſeveral prudent Surgeons have made Tryal thereof to no good purpoſe.

VII. Hitherto I have been giving you my Opinion of the high Operation, which I entertained of it in the Year 1724, when I publiſhed the ſecond Edition of my Chirurgical Inſtitutions in the *German* Language: It therefore now remains for me to give a further Explanation of the Opinion, which I at preſent entertain concerning it. After having conſidered the ſeveral neceſſary Circumſtances, with regard to the Nature and Performance of the Operation, delivered by DOUGLAS, CHESELDEN, THORNHIL, SMITH, PYE, MACGILL, MORAND, myſelf, and others, I readily concluded, from the many Inſtances of Patients happily cured by them, that the great Difficulty of healing the Wound, proceeded not ſo much from the Operation, or the Seat of the Wound itſelf, as from a depraved Habit in the Patient, who is at the ſame Time afflicted with other Diſorders. For otherwiſe the Wound appears to be not ſo difficult to heal in young Subjects, eſpecially Children, provided a proper Bandage be

Eſpecially hazardous in bad Habits of Body.

[a] And that difficult Caſes of this kind may ſometimes happen, in which the moſt expert Surgeon cannot extract the Stone thro' the Wound *in perinæo*, is apparent, not only from the Examples of FRANCUS and GREENFIELD, but alſo by the Acknowledgment of many of our moſt celebrated modern Surgeons, V. RUYSCHII *Obſ.* 89. *Vita Clar.* BORRICHII *in Collect. Script. Chem. Illuſtr.* SERMESIUS *in Lib. de Lithotomia.* DOUGLAS in his Preface, DENIS *Obſerv. Chirurg.* pag. 69, 71, 90, 92. and COLOT *Lib. de Lithotomia in Præf.* pag. 43.

made

made uſe of, and the Wound treated firſt with ſome digeſtive Ointment, and then with a proper vulnerary Balſam, ſuch as *Linimentum Arcei*, *Balſ. Capaiv.* *&c.* reſtraining the Patient in the mean time to a proper Regimen and Diet. And this I can now affirm the more boldly, as there are at this Day a great many Patients happily ſurviving the Operation performed by DOUGLAS, CHESELDEN, myſelf, and others; and a more particular Account of one of the laſt Patients I treated, recovered by this Method, may be ſeen in a Diſſertation which I publiſhed on the high Operation in the Year 1728. So that upon the whole we cannot but think the Performance of this Method of Lithotomy upon Boys and young Men, who are otherwiſe of a good Habit of Body, muſt be attended with Succeſs, as none ſuch have died under my Hands, or thoſe of the fore-mentioned eminent Surgeons; we muſt therefore recommend cutting for the Stone by the *Apparatus altus* to be in many Caſes a laudable Practice[a], as particularly when the Stone is lodged ſo high in the Bladder, or is ſo rough, large, and ſharp-pointed, that its Extraction by the Wound *in perinæo* is thereby rendered impracticable. However, I ſhould rather prefer the *Apparatus Minor*, as more certain and ſafe in young Children and Infants, who are apt to cry violently, rendering it hardly poſſible to fill their Bladder with ſome proper Liquor, an Inſtance of which is deſcribed by MORAND, in his Treatiſe on the High Operation, *pag.* 249 & 250.

Care ſhould be taken not to falſly attribute the Patient's Death to the Operation.

VIII. I am ſenſible, that Examples are not wanting of Patients, who have died ſooner or later in the Courſe of this Operation; but then there are alſo more than a few, who are taken off before a Cure can be wrought by the ſeveral other Methods of Lithotomy; and that the Death of the generality, who have died after the Performance of the high Operation, has been owing rather to great Weakneſs, or a depraved Habit of Body, may appear from many Inſtances, among which many have been deſtroyed by Ulcers in the Kidneys or Bladder, as upon opening their dead Bodies has been evidently demonſtrated. But when the Patient is advanced in Years, or upwards of thirty, as they generally have been long afflicted with the Stone, and perhaps have an Ulcer in their Kidneys or Bladder, attended with other Diſorders and great Weakneſs, in ſuch I have obſerved, that the high Operation ſeldom ſucceeds well, both in my own Patients, and thoſe whoſe Caſes have been deſcribed by DOUGLAS and MORAND, where it is remarked, that ſome Patients have periſhed from the preceding Diſorders, or others from an Abſceſs formed in the cellular Membrane covering the Bladder, and others, again, from a Cancer in the Bladder itſelf; and therefore I never perform the high Operation upon full-grown Men, and thoſe advanced in Years, except there be ſome urgent Neceſſity, and particularly when the Stone cannot be extracted thro' the Perinæum. Care ſhould be therefore taken, not unjuſtly to attribute the Patient's Death to this Operation, when there is no real Cauſe; but the better to vindicate this innocent Method from ſuch falſe Aſperſions, the Surgeon ſhould never perform the high Opera-

[a] The ſame is alſo ſaid of this Method by LE DRAN in *pag.* 105. of his Treatiſe inſcribed *Parallele*, &c. as alſo by GARENGEOT, who ſays (*in Chirurg.* Tom. II. pag. 274) it is in many Caſes (*une Operation excellente*) an excellent Practice, provided the Surgeon carefully obſerves the Limits of the Peritonæum, with regard to the Bladder; of this the Reader may be well ſatisfied, by peruſing the many Inſtances alledged by DOUGLAS, in his Treatiſe on the high Operation, eſpecially in the Appendix, *pag.* 85 & 91.

tion on ſuch Patients as are already wore out with Weakneſs, or oppreſſed with other Diſeaſes, or are even paſſed their thirtieth Year; but for Boys and young Men, there has not been one as yet miſcarried under my Care by this Operation, and very few of thoſe have been loſt, even in the Hands of others, as may appear from the Writings of DOUGLAS, *&c.* on the Subject; but only ſuch as have been advanced in Years, paſſed their thirtieth, and have been reduced by other Diſeaſes. Laſtly, we ought to take notice, as DOUGLAS has rightly obſerved, that it is a bad Preſage, and uſually a moſt certain Forerunner of Death, when the Wound can be neither duly ſuppurated nor cleanſed; but in thoſe in whom a Suppuration happily ſucceeds, being ſuch as are young, and of healthy Conſtitution, there is hardly the leaſt Room to doubt of a certain Cure.

Structure and Situation of the Bladder with reſpect to this Method.

IX. We have already given you our Judgment concerning the high Operation for the Stone; we ſhall now proceed to explain more accurately the Method of performing the ſame, chiefly as it has been executed in my own Practice. But before we proceed to this, it will be previouſly neceſſary, for the ſake of Beginners, to deſcribe the Diſpoſition, Situation, Connexion and Structure of the Bladder, the Knowledge of which is highly neceſſary for the ſafe Performance of Lithotomy, and particularly by this Method. And firſt therefore, upon opening the dead Body of a male Subject, the Bladder being empty, generally appears ſo ſmall and collapſed, that it lies out of View, concealed under the *Oſſa pubis* and Inteſtines, inſomuch that hardly any Part of it can be ſeen; but upon inflating or injecting it with Water, it becomes gradually extended, till at laſt it is conſiderably expanded above the *Oſſa pubis* towards the Navel, ſo that its largeſt and moſt ſuperior Part, termed its Body and *Fundus*, may be plainly viewed. That this Matter might be the more apparent to Beginners, I have, in *Tab.* XXX. exhibited ſeveral Figures, taken chiefly from the celebrated M. CHESELDEN's *Engliſh* Diſſertation on the high Operation, *Anno* 1723. And here, *Fig.* 1. repreſents a dead Subject in an oblique Poſture, being a little inclined to the right, to ſhew the Abdomen chiefly, in which the common Integuments and abdominal Muſcles being laid aſide, we have a View of the Peritonæum, including the Inteſtines, and of a large Part of the Bladder marked A, which ſhews its Body and *Fundus* filled with ten Ounces of Water[a], B the *Urachus* by which the Bladder is connected to the Navel, CC the two umbilical Arteries, DD the *Oſſa pubis* covered with the Integuments turned back, to ſhew that Part of the diſtended Bladder, which riſes up into the Abdomen above the *Oſſa pubis*. *Fig.* 2. demonſtrates the Abdomen entirely open, by removing or cutting off the Peritonæum, by which means the Bladder appears to View, diſtended with twenty Ounces of Water; but here the internal Lamen of the Peritonæum marked AAAA, is left adhering to the Bladder, while its interior Lamen, or cellular Subſtance, which lies next to the Muſcles of the Abdomen, is removed. The Letters BB denote that Part of the Bladder, which lies next the pyramidal and *recti* Muſcles of the Abdomen, the external or cellular Lamen of the Peritonæum being removed, in order to

[a] The Method of filling the Bladder with Water, or ſome proper Liquor, for this Operation, was firſt taught by ROSSETUS, *in Lib. de Partu Cæſareo*, p. m. 263 & ſeq. Edit. Pariſ. Anno 1590. But that this is not always abſolutely neceſſary, may be concluded from Inſtances given by FRANCUS, ROSSETUS, and others, as we ſhall preſently obſerve more particularly.

ſhew

ſhew the muſcular Fibres. CCCCC denote the Bounds or Margin of the internal Lamen of the Peritonæum, inveſting chiefly the *Fundus* of the Bladder, which lies under and touches the Inteſtines, and is the Part of the Peritonæum, by which the Bladder is excluded from the Cavity of the Abdomen [a]. DD the *Oſſa pubis*, EE the Inteſtines, BB denotes the Part in the middle of the Body of the Bladder, which is divided in the high Operation. *Fig.* 3. repreſents only the right half of the Abdomen opened, the Inteſtines and Integuments being removed, AA the upper Part of the Bladder, properly called its *Fundus*, covered with the Peritonæum, which lies next to the Abdomen, and touches the Inteſtines, the Extremity or Bounds of which Part of the Peritonæum is limited by the Letters *a a a a*. BB is the right ſide of the Body of the Bladder itſelf greatly diſtended, being connected to the abdominal Muſcles, and does not communicate with the Cavity of the Abdomen, but is diſtinctly ſeparated from it by the Limits of the Peritonæum marked *a a a a*, ſo that if the Bladder be divided within the Bounds marked *a a a a*, the Urine cannot enter into the Cavity of the Abdomen, but runs off without ſide of the Body, and over the *Oſſa pubis* in the high Operation, where *b b* denotes the Part of the Bladder divided in that Method, in which Place Wounds penetrating into the Bladder are not fatal; CCC the right umbilical Artery; DD the *Urachus*; E the *Os pubis* covered with Part of the Integuments; F the broad Ligament of the Liver; G Part of the Liver itſelf; H Part of the right Kidney; I Part of the right *Ureter*; KK Part of the *membrana adipoſa*; L the left pyramidal Muſcle; M M the left *rectus* Muſcle. *Fig.* 4 is intended to repreſent the whole Abdomen opened, and chiefly the Bladder, moderately, or but little diſtended. AAAAA is the Body of the Bladder covered with the Peritonæum, the wounding of which is generally fatal. BBB denotes the Part of the Bladder, which is without the Peritonæum, the Bounds of which being terminated by the Line CCC, and the Margin of the *Oſſa pubis* DD, takes in but a ſmall Compaſs, whence may be learned, how cautiouſly a Surgeon ought to proceed in cutting for the Stone in the high Operation, when the Bladder is but little diſtended; and in what manner the Bladder ſhould be then carefully inciſed or divided by a narrow Scalpel; for if the Bladder be wounded in that Part of its *Fundus*, which is covered with the Peritonæum, ſo as to tranſmit the Urine into the Cavity of the Abdomen, the Wound is then mortal, or incurable; the Bladder ſhould be therefore divided only in that Part, which lies uncovered with the Peritonæum marked BBB. EE denote the Inteſtines.

Method of performing the High Operation.

This neceſſary Account of the Parts being thus premiſed, without which no body ought inconſiderately to undertake the Operation, we ſhall now proceed to deſcribe the Operation itſelf. The Patient having been duly prepared beforehand for the Operation, by a proper Regimen, Diet, *&c.* [b] is to be, at the

[a] GARENGEOT in Tom. II. Pag. 274. of his *Surgery*, ſays, that the Bladder is *(hors du ventre)* without the Abdomen; which ſeems, in my Opinion, to be a falſe Aſſertion: The Bladder is indeed, eſpecially when collapſed, without-ſide the Peritonæum, but not without-ſide the Abdomen: becauſe it is ſituated in the *Pelvis*, which is that lower Cavity of the Abdomen formed by the *Oſſa innominata* and *ſacrum*; but this is allowed by the general Conſent of Anatomiſts, to be Part of the Abdomen; and therefore any Part ſituated in the *Pelvis* is alſo ſituated in the Abdomen.

[b] Of what great Conſequence this kind of Preparation may be to the Patient, has been ſhewn both from Reaſon and Experience by Dr. MIDDLETON in his Treatiſe on this Method.

Time

Time appointed, firſt laid in ſuch a Poſture upon the Table or Bed, that his Breech may riſe a little higher than his Head, in which Poſture his Head, Arms, Legs, and Breaſt are to be held firm by ſtrong Aſſiſtants, without truſting to Ligatures, leſt the Patient ſhould be injured by his ſtruggling; upon which account alſo ſome prefer the Bed before a Table [a]. Under his Head ſhould be placed a Pillar, ſo that his Back may be hollow, that the abdominal Muſcles may by that means be in ſome meaſure relaxed. Then a Silver Catheter adapted by one End to a flexible leathern Tube, *Tab.* XXX. *Fig.* 5. AA, DDD, is to be gradually and ſlowly introduced into the Bladder: Inſtead of the leathern Tube may be uſed the Windpipe of an Indian Cock, according to DOUGLAS, or the Ureter of an Ox, according to CHESELDEN; to which is to be faſtened the Tube C, to be afterwards fitted to a large Syringe, by which means ſuch a Quantity of warm Water, Milk, or Barley Water is to be gently thrown into the Bladder, as the Patient can well bear, without giving him Pain or Uneaſineſs, or rather till the Bladder appears full and ſufficiently diſtended [b]. This being rightly performed, the Catheter is then drawn out of the Bladder, and the Penis with the Urethra is in the mean time compreſſed by an Aſſiſtant, or it may be tied with a broad Tape. Then ſtanding on the right ſide of the Patient, my Method is to direct a prudent Aſſiſtant to inſert his Index and middle Finger into the Patient's Anus, in order to elevate the Stone and Bladder, or preſs them againſt the *Oſſa pubis*, in the mean time I make an inciſion with a ſmall Scalpel, *Tab.* XII. *Fig.* 14. firſt thro' the Skin and Fat, and then by degrees thro' the abdominal Muſcles in a right Line, immediately above the *Oſſa pubis*, a little on one ſide of the Bottom of the *Linea alba*, or even in the *Linea alba* itſelf [c], (ſee *Tab.* XXX. *Fig. bb* or *Fig.* 4. BC.) The external Wound ought to be about three Fingers breadth long in Children, but in Adults it may be four Fingers, or a Hand's-breadth. Then inſerting the Fingers of either Hand into the Wound, particularly the left Index, I thereby feel the Bladder diſtended with Liquor immediately above the Margin of the *Oſſa pubis* at their *Symphyſis*; which is yet not eaſily to be diſcerned, when the Bladder is not much diſtended, the Muſcles being rigid, or convulſed, and the Bladder itſelf perhaps harder than uſual: I then make an Inciſion, with the ſame Scalpel, or with a falciform one, having a ſharp Point, in the Body of the Bladder immediately above the *Symphyſis* of the *Oſſa pubis*; or elſe, as I once practiſed with Succeſs, I make an Aperture in the Bladder with the triangular Needle

[a] CHESELDEN in his Treatiſe on the High Operat. *p.* 6. MORAND and WINSLOW *in Lib. de Alto Apparatu*, pag. 232 & 331. and particularly ROSSETUS, *p.* 270.

[b] Some Surgeons, and particularly GARENGEOT, direct the Bladder to be filled till it can be perceived diſtended above the *Oſſa pubis*. But I have experienced that this can hardly be perceived in dead Subjects, nor even in the living, becauſe of the Pain and ſtrong Contraction of the Muſcles; to which we may add, that CHESELDEN gives an Inſtance of the Bladder being broke by injecting too much Water; and the Diſtention of the Bladder by blowing in Wind with a Pair of Bellows, as SOLINGEN adviſes, is rejected by ROSSETUS as both uſeleſs and pernicious.

[c] Some Surgeons, and particularly GARENGEOT, ſay, that it is dangerous to make the Inciſion in the *Linea alba*, which ſhould be therefore cautiouſly avoided. But this appears to be a vain Caution, both from Experience, by which myſelf and many of the moſt eminent Lithotomiſts have found, that the Inciſion will heal, as well in this Part, as in the muſcular, as alſo from the Authority of M. WINSLOW, who pronounces it to be an uſeleſs, and almoſt bad Caution. Vid. MORANDI *lib. de alta Operatione*, pag. 92, 209, 235, 336, 350.

or Bodkin of the *Trocar* [a] with the Cannula, *Tab.* XXIV. *Fig.* 2. But this ſhould be done very cautiouſly when the Bladder is very little, or not at all diſtended, for fear of wounding the *Fundus* of the Bladder; then inſerting the Fore-finger of my left Hand into the Perforation, I therewith gently remove the Peritonæum backward from the *Oſſa pubis*, upon which it lies almoſt incumbent, and this to avoid injuring the Peritonæum, or the *Fundus* of the Bladder, I then paſs a ſmall Inciſion-knife obliquely behind the *Oſſa pubis* into the Body of the Bladder towards its Neck, in ſuch a manner that I make the Inciſion only with the Point thereof. This done, Part of the injected Water, Liquor, or Urine retained in the Bladder, immediately flows thro' the Wound. A ſlender Inciſion-knife is uſed to perforate the Bladder here, becauſe a broad one might eaſily wound its *Fundus*, and render the Operation fatal. Through the Perforation or ſmall Wound, I then paſs a crooked or ſtraight Scalpel, but armed with a Button at its Point, and by elevating the Knife, enlarge the Wound for the Breadth of one or two Fingers, according to the Size of the Patient; and in this Method it is not eaſy to wound the Peritonæum, or Fundus of the Bladder, but the opening is made in its Body only about its middle, and towards the Neck, *Tab.* XXX. *Fig.* 2. B B. But the Peritonæum marked A A A, *Fig.* 2, 3, & 4. is left intire without the leaſt Puncture. There are ſome Surgeons, who adviſe the Inciſion to be made from the upper Part of the Bladder a little below the Urachus, and to be continued from thence to the *Os pubis* at one Section [b]; at the ſame time they condemn this Method of mine as dangerous, tho' I took it from Rossɛt and Douglas; and they alſo ſay, that all or moſt of the Danger in the Operation, conſiſts in making this Inciſion [c], which I readily grant them. But as we can hardly ever be certain how far the Bladder is diſtended, and whereabouts that Place is under the Urachus, which they would have divided, I muſt needs think the Method here propoſed by me to be the ſafeſt, eſpecially when the Inciſion is made ſlowly and cautiouſly with a blunt-pointed Scalpel, or one that is armed with a Button, tho' that is alſo rejected by ſome of them. By this means I never wounded the Peritonæum, tho' I have juſtly performed the Operation in ſeveral Caſes, where the Bladder hath had little or no Diſtention; whereas, on the contrary, thoſe who make their Inciſion from above downward, generally wound the Peritonæum [d], which is attended with grievous Symptoms, and the Death of the Patient, notwithſtanding they had taken care to diſtend the Bladder well by injecting ſome Liquor. But my Method of dividing the Bladder ſucceeds as well in thoſe Caſes where it is diſtended with Liquor, as when it has little or nothing in its Cavity; and is therefore preferable in all Caſes; whereas their Method is not well practicable, but when the Bladder has been diſtended to a great Degree; and therefore my Method has been preferred to theirs by Thibaut, a late celebrated Lithotomiſt at *Paris*, as Winslow and Morand [e] inform us. When I have juſt perforated the Bladder ſufficient to admit my Finger by the Side of

[a] This Method is not deſcribed by any that I know of.
[b] See Cheselden on the High Operation, Middleton *pag.* 17, 18. Morand Tr. *de alto Apparatu*, pag. 33, 94.
[c] Middleton loc. cit. *pag.* 20. Morand p. 100.
[d] Vid. Middleton, *pag.* 35, 36. & Morand *pag.* 131, 134.
[e] Morand *lib. de alt. Op.* pag. 333.

the

the Scalpel, I generally introduce my left Fore-finger, and bending it in Form of a Hook towards its Fundus, I gently draw that Part and the Peritonæum upwards toward the Navel, and then enlarge the Wound downward with the Scalpel, by directing it towards the *Oſſa pubis* and Neck of the Bladder; whereby the opening is generally made ſufficiently large. In the mean time I alſo introduce the Fore-finger of my other Hand into the Bladder, and therewith examine the Size and Situation of the Stone; or whether, if it be large, there will be any Occaſion to dilate the Wound ſtill more; when theſe have been conſidered, if I find it neceſſary to further dilate the Wound, leaving my Finger ſtill in the Bladder, I elevate the ſame a little, and enlarge the Wound either upward, downward, or both, as far as may be ſafely without wounding its Fundus, 'till I think it ſufficient for the Extraction of the Stone [a]. But if the Stone be ſmall, and the Inciſion already ſufficiently large, I then lay aſide the Knife, and deſire the Aſſiſtant, who has his two Fore-fingers inſerted in the Patient's Anus, to preſs the Bladder and Calculus forwards as much as poſſible; during which I endeavour to extract the Stone by my Fingers, when it is ſmall; and when they are inſufficient, or the Stone large, I introduce the Hook, *Tab.* XXVII. *Fig.* 10. or the Stone Forceps, according as it may be more or leſs conveniently taken hold of by either [b]. In ſome Patients, who were fearful of having Water or any other Liquor injected into their Bladder, I have ordered a large Quantity of Tea to be drank, keeping a Stricture upon the Urethra in the mean time, by the Yoke or Inſtrument repreſented in *Tab.* XXVI. *Fig.* 9. that by this means the Bladder may be naturally diſtended; and I have thus commodiouſly inciſed the Bladder, and extracted the Stone, notwithſtanding ſome deny it to be poſſible [c]. In ſuch Patients where the Stone cannot be extracted thro' the Peritonæum, which Caſe has twice occurr'd to myſelf, and where the Bladder can neither be diſtended by injecting Water, nor retaining the Urine by Reaſon of the Wound made, which has happened alſo to GREENFIELD, and I believe FRANCUS; in that Caſe, having carefully divided the Skin and Fat, betwixt the *recti* Muſcles of the Abdomen, I then cautiouſly inſert the Fore-finger of my left Hand between the *Os pubis* and Membrane of the Peritonæum (for which conſult *Tab.* XXX. *Fig.* 4. and COWPER's *Anat.* or BIDLOW's *Tab.* 41. BB.) and thereby thruſt it back from the *Oſſa pubis*, that I may have room to make firſt a ſmall Inciſion, and then a larger, in the Body of the Bladder, and thereby extract the Stone, without injuring the Peritonæum, or Fundus of the Bladder. This Method of performing the Operation without diſtending the Bladder, is not

[a] Some would inſinuate, that it is neither practicable nor ſafe thus to enlarge the Wound after the firſt Inciſion, but it may be ſecurely performed with the obtuſe pointed Scalpel.

[b] M. DENYS reckons it one of the Defects of this Operation, that the Stone may be ſometimes extracted by the Fingers; which in my Opinion ought to be eſteemed one of its greateſt Advantages.

[c] This Method of filling the Bladder has been propoſed by ROSSETUS *pag.* 269 & 275, and particularly by plentiful drinking of Spaw-waters, or ſome other diuretic Liquor; but I do not know that any, either of the *French* or *Engliſh*, have followed his Advice, and taken up the Practice; but that it may ſucceed, will appear not only from Caſes of my own, but alſo from a remarkable one of PROBISCHIUS, who cured a Lad of twelve Years old by this Method, notwithſtanding he wounded the Peritonæum to ſuch a degree, that the Inteſtines prolapſed, as he tells us in a *German* Tract *de Operatione Alta*, *Anno* 1727. But WINSLOW adviſes for the Patient to uſe himſelf to retain his Urine for a conſiderable Time after drinking plenty of Tea, and, for ſeveral Days before the Operation, to cauſe a gradual Expanſion of the Bladder, MORAND *p.* 310.

taken notice of by any that I know of, who have writ on the high Operation, notwithſtanding it may be very uſeful, and even neceſſary in ſome Caſes; and that therefore diſtending the Bladder by injecting ſome Liquor, is not ſo neceſſary to the Operation as many have imagined. Tho' it muſt be owned, that more Caution and Diligence is required in this Way, than when the Bladder is filled with ſome Liquor.

Whether the Fundus of the Bladder may be divided.

XI. Some Surgeons tell us, that the Fundus of the Bladder is to be divided in this Operation, and that the Stone is to be extracted that Way; among which Authors GARENGEOT is the principal in both Editions of his Chirurgical Operations. But this is a bad and even dangerous Advice, being a falſe and erroneous Aſſertion ariſing from a wrong or imperfect Knowledge of the Bladder and its Parts. We may alſo obſerve, that GARENGEOT in his *Splanchnologia*, treating on the Bladder, does not ſay one Word of its Parts, and the Manner of dividing it, tho' it be of the laſt Importance to Beginners in Chirurgical Operations and Wounds where the Bladder is concerned, and more eſpecially with regard to the ſeveral Methods of Lithotomy. Others divide the Bladder wrongly into two Parts only, its Neck and Fundus, omitting its Body, and theſe, in deſcribing the high Operation, tell us, that the Fundus of the Bladder is the Part to be inciſed, which, as we have before obſerved, is, by the general Conſent of the moſt prudent Phyſicians, allowed to be mortal; becauſe the Urine has then a Paſſage into the Cavity of the Abdomen, and, by its Putrefaction and Acrimony, deſtroys the Patient. If we would therefore conſider the Parts of the Bladder diſtinctly, we ought to divide it into its Neck, Body, and Fundus, as I did many Years ago in my *Anatomical Compendium*, conſidering it as a Pitcher or Jug, to which RIOLAN [a] and other Anatomiſts have very aptly compared it, in which Veſſel there is the Neck, the capacious Body of it, and the Bottom, upon which it ſtands; but it would appear abſurd in the Eyes of any one to call the Body of the Pitcher, which follows its Neck, the Bottom of it, ſince by the Bottom of it is commonly underſtood the lowermoſt Part of the Pitcher oppoſed to its Neck and Mouth; and ſo in the Bladder, which repreſents a Pitcher or Stone-bottle inverted, we may reaſon in the ſame manner. See *Tab.* XXIX. *Fig.* 8. or *Tab.* XXXII. *Fig.* 1, 2. Therefore (in *Tab.* XXIX. *Fig.* 8.) the Letters A A denote the Neck of the Bladder, B B the Body, or Bladder itſelf, and C its Fundus, tho' that Part is our erect Poſture uppermoſt, D the proſtrate Gland, E E Part of the ſeminal Veſicles in a Lad or Boy under twelve Years of Age. Otherwiſe as the Bladder is commonly conſidered out of the Body, that Part by which the Butcher inflates it is termed the Neck, the Part oppoſite to this, its Fundus or Bottom, and the Part intercepted betwixt theſe two is juſtly called the Body, or Bladder itſelf, which is the Part to be divided in the high Operation, and not the Fundus, which has been rightly obſerved by ROSSETUS above an hundred Years ago [b]. As in cutting for the Stone by the *Apparatus Minor* of CELSUS, and by the Lateral Operation, the Body of the Bladder is divided in the inferior lateral Part of its Face, which by ſome is not improperly called its Baſis. *Tab.* XXIX. *Fig.* 1. So in the high Operation the Body of the Bladder is divided in the middle and lower Part of its Face, as

[a] Anthropographia, *Cap.* XXII. *de Veſica.*
[b] Lib. *de partu Cæſarco*, p. m. 261, 271, 272. edit. Pariſ. Anno 1590.

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in *Tab.* XXIX. *Fig.* 8. *litt.* BB. and *Tab.* XXX. *Fig.* 2. BB. But in no Method is the Fundus of the Bladder divided. For whenever the Fundus of the Bladder, *Tab.* XXX. *Fig.* 2, 3, and 4. AAA, or that Part of it next the Inteſtines, which is covered with the internal Lamen of the Peritonæum, is divided or perforated, ſo that the Urine may paſs thro' the Wound into the Abdomen; in that Caſe the Wound certainly proves fatal, as we obſerved before. Therefore no Regard is to be had to thoſe who raſhly tell us, that the Fundus of the Bladder ſhould be divided in the high Operation, even tho' they aſcribe their Opinion to ROSSETUS, who never entertained any ſuch Thoughts, but only directs the Body of the Bladder to be inciſed betwixt its Neck and Fundus, where it is not covered with the Peritonæum, as is before demonſtrated. The great Anatomiſt RIOLAN has diſcourſed ſo diſtinctly concerning the Neck, Body, and Fundus of the Bladder, that it ſeems ſurprizing to me, that the Generality of the modern *French* Surgeons ſhould have altogether neglected the Diſtinction, which in my Opinion is of the higheſt moment, and inconſiderately declare as a matter of no Conſequence, that the Fundus of the Bladder is to be divided. Moſt of the *Engliſh* Surgeons, on the contrary, are of the Opinion with myſelf and ROSSET, that the Body only of the Bladder ſhould be inciſed; as may appear by one Inſtance among many, taken from the Words of MIDDLETON, tranſlated into *French* by MORAND, when he ſays: "If the Inciſion in the Body of the Bladder "is ſufficiently large," *(quand l'inciſion dans le corps de la veſſie eſt ſuffiſament étendue, &c.)*

What is to be done after the Operation.

XII. The Stone being extracted according to the Directions I gave at N° X. the next thing to be done by the Lithotomiſt is to paſs his Fingers into the Bladder, to ſearch if any thing yet remains there which ought to be extracted; which may be better done in this way of cutting than any other. If no foreign Body can be found, the Wound being covered with a Linen Cloth, or Compreſs, the Patient is to be then laid upon the Bed, and the Wound dreſſed with ſome dry Lint laid upon the other Cloth, which is to keep it from ſlipping into the Bladder, and the whole is to be retained by a Compreſs, and a large Napkin folded together, and applied round the Abdomen, in the ſame manner as is uſual in other Wounds of that Part. Within a few Hours after the Operation, the Wound is to be again dreſſed with ſcraped Lint ſpread with ſome digeſtive Ointment, and retained with an Emplaſter, over which ſhould be applied a thick Compreſs wetted in *Aq. Calc. cum Spir. Vin. Camph. Lap. Medicamentoſ. & Sal. ammoniac. admixt.* or in warm Wine, in which hath been boiled ſome diſcutient Herbs, which being applied round the greater Part of the Abdomen, ſhould be frequently renewed, and retained by a Napkin faſtened tight round the Body. This Proceſs ſhould be continued often for the firſt four or five Days after the Operation, to prevent any violent inflammation. Thus with Care and diligent Attendance the Wound will come to Suppuration, and be perfectly cleanſed within the ſpace of ſeven, eight, or more Days in young Men and Boys, and ſometimes even in old Men of a healthy Conſtitution, and then the Wound is to be dreſſed once or twice in a Day with *Lin. Arcæi*, or *Balſ. Capiv.* &c. and the Lips of the Wound ſhould be brought & retained together by ſticking Plaſter judiciouſly applied, as in the dry Suture. But a more early Application of theſe Plaſters I take to be not only uſeleſs, but pernicious, inaſmuch as they prevent or retard the cleanſing of the Wound. Over the Plaſter

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it will be proper to apply an uniting Bandage, or the Napkin in Uſe before may be now faſtened a little tighter round the Abdomen; and thus things ſhould be continued till the Bladder and Lips of the Wound are united, and the Urine entirely diſcharges itſelf by the natural Paſſages. And this Agglutination of the Wound ſucceeds ſometimes in three or four Weeks, and ſometimes longer, more or leſs according to the Patient's Age, Habit, and other Circumſtances.

What is to be obſerved farther.

XIII. When the Patient is ſo well recovered as to be able to riſe out of Bed, ſit up, and walk about, I do not deny them in thoſe reſpects ſome refreſhment when they have a ſtrong Deſire for it; nor do I rigidly confine them to lie always on one Side or on their Backs, as ſome do, to the great Uneaſineſs of the Patient, and without any viſible Advantage. Among thoſe whom I have cured by this Operation, I remember a Lad of thirteen Years old, who, being fatigued with long lying in Bed, left his Bed without my Leave on the ſeventh Day after the Operation, and continued to ſit up, and walk about for ſome time, without any apparent ill Conſequence, the Agglutination of the Wound in the mean time ſucceeding very well, being perfectly cured in the fourth Week. In ſome Patients the natural Paſſage of the Urethra is obſtructed with a ſandy and mucous Subſtance, ſo that the Urine cannot make its Exit that Way; in which Caſe the beſt Method is to lay the Patient on one Side, and inject warm Water thro' the Urethra into the Bladder, by which means the offending Matter may be expelled through the Wound; or inſtead of injecting Water, a Blow pipe may be inſerted into the Urethra, and the Matter thereby inflated into the Bladder, to be afterwards diſcharged at the Wound, by either of which Methods the Urine generally paſſes afterwards in its former Courſe by the Urethra, This Artifice was firſt practiſed by Rungius, an eminent Surgeon at *Breme*, after he had ſeen me perform the ſame Operation with Succeſs in the ſame City. If the Calculus ſhould be broke in the Attempt to extract it, it may be then taken out with the Fingers, and extracted in pieces; or if that cannot well be performed, Rossetus has contrived a convenient Inſtrument in the Form of a narrow Spoon, incurvated in a particular manner, as he repreſents *(pag.* 280.*)* whereby the Stone and Sand, if there be any, may be eaſily drawn out. To facilitate and promote the Agglutination of the Wound, Rossetus adviſes the conſtant Retention of a Catheter in the Urethra, that the Urine may always meet with a free Paſſage to flow out of the Bladder, without paſſing through and offending the Wound. In Imitation of which M. Morand has contrived a ſhort Catheter, from whence he promiſes to himſelf great Advantages. See his Treatiſe on the High Operation, *p.* 240, and 254, where a leaden Probe was introduced, which had been before recommended by Le Dran, *pag.* 341.

The Uſes and Advantages of this Method.

XIV. Leſt any Body ſhould think, that this Method of cutting for the Stone was contrived without any manner of Neceſſity, we ſhall briefly conſider the chief Advantages thereof, and enumerate the Particulars, wherein it ſeems to excel the foregoing Methods. And firſt, as in this Operation there is no Wound made in the Sphincter, or Neck of the Bladder, proſtrate Gland, or Urethra, which are alſo neither of them in the leaſt injured by the Knife, Forceps, or other Inſtrument; there is therefore not the leaſt Room to fear an Incontinency of Urine, or a Fiſtula in the Urethra and Perinæum from that Quarter;

ter; with which Diſaſters thoſe who are treated by the *Apparatus Major*, or even in the lateral Operation are uſually afflicted. 2. When the Stone is large and rough, or angular and prickly, the Neck of the Bladder and proſtrate Gland are then violently contuſed, lacerated and injured, as well in cutting by the *Apparatus Major*, as in a ſomewhat leſs Degree by the lateral Method; in conſequence of which there generally follows violent Pains, Inflammation, and incipient Mortification in the Bladder, which uſually terminate in Convulſions and Death; whereas in this Method, where the Wound is made in the anterior Part of the Body of the Bladder, immediately above the *Oſſa pubis*, thoſe malignant Symptoms in the Neck of the Bladder and Urethra are not in the leaſt to be feared. 3. And for the ſame Reaſon too, the Parts ſubſervient to Generation, as the proſtrate Gland, Muſcles of the Penis, and ſeminal Veſicles, with their excretory duct, *&c.* are not ſubjected to receive any Injury by this Method; which Parts being wounded or hurt by the Apparatus major, or in the lateral Operation, the Patient is often thereby rendered ſteril, or at leaſt not ſo capable of the conjugal Offices. 4. Neither the Ureter, Rectum, nor any large Blood Veſſels are endangered in the High Operation of FRANCUS, tho' they may be eaſily wounded in the other Methods, and thereby a dangerous Hæmorrhage, and other bad Symptoms brought on; whereas there are only a few ſmall Veſſels diſtributed in the ſuperior Part of the Bladder, and the Inteſtinum rectum, with the Ureters, are far enough off from the Wound. 5. If the Calculus appears from certain Signs to be rough and ſharp-pointed, (which we may know partly from the violent Pains and frequent Diſcharge of bloody Urine, which it occaſions, as well as from the Touch by the Finger *in Ano*) the Extraction of it is then ſcarcely practicable with Safety, either by the Appartus major, minor, or by the lateral Operation, as is confirmed by Reaſon, and repeated Inſtances in Practice; whereas by this Method the Extraction may be very commodiouſly performed, as there is an ample Aperture made in the Bladder, which may be ſtill further enlarged upon Occaſion, according to the Size and Nature of the Stone. 6. This Method of cutting may be performed with fewer Inſtruments than either the Apparatus major, or the lateral Operation, and the Stone may be often this way extracted with the Fingers only, and the more ſimple Methods of operating are always preferr'd by the judicious to thoſe which are more complex and difficult. 7. Neither the Bladder nor Urethra are in this Method moleſted, or irritated by Catheters, which frequently occaſion Pain, Inflammation, and other bad Symptoms, as TOLET [a], and others acknowledge. 8. If the male or female Conductor be thruſt into the Bladder a little too forcibly or deeply in the Apparatus major, or in the lateral Operation, it is thereby frequently wounded, if not thereby abſolutely perforated, which laſt is mortal, as GARENGEOT [b] aſſerts; which in the Apparatus altus is not in the leaſt to be feared, as thoſe Inſtruments are never uſed in that Method, there being no Occaſion for them. 9. Nor is there any Neceſſity to bind the Patient with Ligatures, or ſecure him in ſo formidable a Poſture for the high Operation, as muſt be for the Apparatus major; whereby the weak Patient has been ſometimes obſerved to be almoſt killed

[a] Lib. de Lithotom. *Cap.* XIII.

[b] Tom I. Edit. 1. Cap. de Lithotom. *pag.* 352. An Example of this kind may be alſo ſeen in SAVIARD, *Obſ.* 37.

with

with Fear before the Operation is begun [a]. 10. We can in no Method inſert our Fingers ſo eaſily, nor ſo far into the Bladder as in this; and therefore we cannot in the other Methods ſo well inform our ſelves concerning the Size, Figure, or Number of the Stones, with the moſt convenient Method of extracting them, and whether the Bladder is abſolutely cleared of them; all which may be more certainly and commodiouſly performed in the high Operation. M. Denys, the great Patron of the *Ravian* Method of Lithotomy, confeſſes, that ſmall Stones cannot indeed be eaſily found in the lateral Method of Ravius; but that, ſays he, is a Defect in common to all the Methods; but the *Apparatus altus* cannot be ſaid to labour under the ſame Defect; for in that Method even ſmall Stones may be eaſily found, as we often know by Experience, and as he himſelf acknowledges ſoon after, in *pag.* 117. When the Stone is ſo ſmall, that it cannot be found, nor taken hold of in the lateral Method, the ſame Author (*pag.* 130.) adviſes the Lithotomiſt to relinquiſh the Operation; whereas he might readily extract it by the *Apparatus altus*. Nor are we as yet furniſhed with any Inſtance, in which a ſmall Stone could not be extracted by the high Operation, ſo as to fruſtrate the Proceedings of the Operator; the *Apparatus altus* is therefore much preferable on this account to the lateral Method of Lithotomy. 11. If the Stone ſhould adhere or grow to the Bladder (which tho' denied by Rosset, Douglas, and others, is yet confirmed by the Experience of Middleton and Thornhill [b], a remarkable Inſtance of which, among many others, has occurred to my own Obſervation, a Deſcription of which may be ſeen in my Diſſertation *de Alto Apparatu*, pag. 43.) it may very often in that Caſe be ſeparated by the Fingers in this Method [c]. But if it appears too large to be extracted, we do not hereby torture the Patient to Death, as is often done in the other Methods of Lithotomy; but being perfectly convinced of the Caſe, we judiciouſly deſiſt in Time. 12. The Stone is not eaſily to be broke in this Method of extracting it, as in the *Apparatus major* is frequently done; becauſe in this Method the Extraction is not made thro' ſo narrow an Aperture, the Wound being of itſelf ſufficiently large, and ſtill capable of a further Extenſion, as the Bladder is more dilatable in its Body than towards its Neck. And if the Stone ſhould be broke in this Method, from its being of too ſoft a Texture, the Fragments of it may be more eaſily and certainly extracted, either by the Fingers, Scoops, or other proper Inſtruments, than in any other Method of Lithotomy, even with the Conſent of the moſt eminent of the *French* and *Engliſh* Surgeons. 13. Stones of a longitudinal Figure, ſituated in a tranſverſe Poſition in the Bladder, are of all Stones the moſt difficult to extract, and not without great Pain and Danger, if at all in the common Method of Lithotomy; whereas in the *Apparatus altus* there is no ſuch Difficulty or Danger, as it may be more ſecurely taken hold of in its leaſt Diameter. 14. If the Stone cannot be found or extracted in the *Apparatus major*, or in the lateral Operation, from its being concealed in ſome Fold or Cavity of the Bladder, ſuch as hath been obſerved by Riolan [c], or from any other Cauſe; or if the grooved

[a] Vid. Winslow's Epiſt. in Morand. lib. de *Alto Apparatu*, pag. 331.
[b] Vid. Morand. Tr. de *Alt. Apparat.* pag. 152. & Middleton pag. 44.
[c] Vid. Lithotom. Douglas Edit. II. pag. 65.
[d] Anthropograph. *Cap.* XXIII.

Catheter

Catheter cannot be paſſed into the Bladder, becauſe of ſome Inflammation, or Tumor in its Neck, or at the proſtrate Gland, or from the exquiſite Pain, Hardneſs, a Tubercle, or Stone in the Urethra, or Neck of the Bladder [a], or from a Phimoſis, or intenſe Stricture of the Prepuce, or if the Patient utterly abhors, or is averſe to the Catheter, Inſtances of which have been known by myſelf and others; in all theſe Caſes the *Apparatus altus* is the only Method of relieving the Patient, as hath been experienced by FRANCUS, GREENFIELD, myſelf, and perhaps others, and at leaſt the like Accidents may happen hereafter; and therefore upon theſe and other Accounts the high Operation is preferred to the Apparatus major by CHESELDEN, MORAND, GARENGEOT, and others. 15. But one of the chief Advantages of this Method of cutting, which is eſteemed ſo by ROSSET and PIETREUS, is, that it may be more eaſily performed than any other Method of Lithotomy, inſomuch that any young Beginner [b] in Surgery may undertake it with a little Judgment, becauſe the Inciſion is here to be made of no great Depth, but right down thro' the Integuments and Muſcles of the Abdomen into the Cavity of the Bladder, when it has been previouſly filled and diſtended with ſome convenient Liquor, without being obliged to obſerve any particular Meanders or Incurvations of the Urethra. But when, for various Reaſons, the Bladder cannot be thus previouſly filled and diſtended, then indeed it cannot be eſteemed ſo eaſy an Operation, but muſt be attended with ſome Danger from the Smallneſs of the Space in which the Inciſion is to be made into the Bladder betwixt the *Oſſa pubis* and *Peritonæum*, whereby a ſmall Slip or Exceſs in the Inciſion may divide the Fundus of the Bladder, and occaſion a mortal Wound, eſpecially if one ſhould make their Inciſion from above downwards, *i. e.* from the Fundus of the Bladder or Urachus towards the *Oſſa pubis*, according to the precarious Directions given by ſome Lithotomiſts; for in that Caſe it may be juſtly reputed a difficult Operation, requiring the Hand of one well verſed in Anatomy and Surgery. It is in Conſideration of this Danger that all prudent Surgeons, who have treated on the Operation from ROSSET down to the preſent Day, have adviſed a previous Diſtenſion of the Bladder with ſome Liquor, as a thing highly, if not abſolutely, neceſſary to cure the Patient. And for the ſame Reaſon the eminent Lithotomiſt TOLET prudently adviſes thoſe, who intend to cut for the Stone by the high Operation, firſt to perform the ſame frequently upon dead Subjects, and eſpecially (which is worth obſerving) when the Urine is firſt diſcharged; leſt he ſhould be incapable of rightly performing the Operation in difficult Caſes, where the Bladder cannot be diſtended without endangering the Patient's Life.

XV. Before we cloſe this Chapter, it may not be amiſs to obviate a few of the chief Objections, which may ſeem to be ſtarted with Plauſibility by ſome of our modern Surgeons and Lithotomiſts againſt the high Operation; which we ſhall do, not out of Love for cavilling, but only from a Deſire of expoſing the Truth, and of improving the important Operation of Lithotomy. M. DENYS,

Objections againſt this Method.

[a] An Example of the high Operation being happily performed in a Caſe where the Catheter could not be paſſed into the Bladder from a Stone obſtructing its Neck, may be ſeen related in COLOT. *in Lib. de Lithot.* pag. 45. notwithſtanding he was a profeſſed Enemy to that Method. See SAVIARD Obſ. *pag.* 203.

[b] As it was performed by ſeveral at *Paris*, according to the Relation of M. WINSLOW in MORAND. *Lib. de Lithot.* pag, 329.

NYS, Surgeon and Lithotomiſt at *Leyden*, who was formerly Aſſiſtant to M. RAW, or RAVIUS when alive, and ſucceeded him in Lithotomy upon his Deceaſe, being at preſent a ſtrenuous Defender of his Method, tells us [a], that the high Operation is in many Caſes impracticable upon many accounts, and that thoſe Patients, who cannot be freed from the Stone by that Method, might yet be cured by the lateral Operation of RAW. But I ſhould have deſired that Gentleman firſt to have demonſtrated, or ſpecified ſome of thoſe many Caſes wherein he aſſerts the high Operation to be impracticable, and then to have proved it by inſtancing an Example in Practice, in which the Stone could not be extracted by the high Operation, and was afterwards effected notwithſtanding by the lateral Method of RAW. For my own part I can find no ſuch Example; but, on the contrary, I have before obſerved, that I extracted the Stone from two Patients by the high Operation, when I could not effect the ſame *in perinæo* by the lateral Method, notwithſtanding I might ſafely affirm myſelf perfectly verſed in the Practice of it. M. DENYS indeed tells us of a Caſe, in which RAW could not extract the Stone by the high Operation, (*pag.* 69 & 71.) and of another (*p.* 91, 92.) that happened to the eminent Lithotomiſt of *Amſterdam*, BORTELIUS; by which laſt I have often ſeen this very Method performed with great Parade and Dexterity. The laſt mentioned Lithotomiſt indeed grants, that the high Operation may be ſucceſsfully performed too upon young Children, (and therefore he does not diſapprove of it;) but that it cannot well be performed upon all, eſpecially young Infants. But even among theſe I muſt again ſay, that I never yet met with an Inſtance where the high Operation was performed, and the Patient could not be freed from the Stone thereby, though it has in ſome Caſes been very large, (ſee *Tab.* XXXII. *Fig.* 6.) and therefore ſuch Inſtances ought to have been produced; whereas, on the contrary, there are many Caſes in which the Stone could not be extracted by the other Methods of Lithotomy.

First Objection, that it is often impracticable.

XVI. The Second Objection raiſed by the ſame Author againſt the high Operation is, that it takes up a longer Time in the Performance than the lateral Method, (in *Pref.* pag. 5, & 99.) But if we except the previous Diſtenſion of the Bladder, by filling it with ſome Liquor, the Inciſion itſelf, and Extraction of the Stone, may be performed in as ſhort a Time as in the *Apparatus major*, and lateral Operation, if nothing extraordinary ſhould hinder; and it is apparent to every one, that the filling of the Bladder is not the Operation, but only one of the preparatory Requiſites in the *Apparatus*. We alſo obſerve, that, in the lateral Operation and the *Apparatus major*, Obſtacles frequently occur, which greatly impede and prolong the Operation, even as M. DENYS himſelf has confeſſed, by relating ſome Obſervations on this Head, particularly (*pag.* 57.) that M. RAW was one Time three Quarters of an Hour in ſearching after, and extracting the Stone. In ſhort, I may boldly aſſert, that the high Operation may

Second Objection, that it is longer in performing than the lateral Method.

[a] In Obſ. Chirurg, de Calculo & Lithotomia, An. 1731. in Pref. *p.* 4. In which Preface he aſſerts, that he publiſhed the Book to favour the World with what Obſervations he had made in the Practice of the Lateral Operation of RAVIUS; and the ſame thing he repeats again in the Beginning of his Treatiſe, *page* 2. But all this he ſays without doing it; for he does not ſo much as give us a full Deſcription of the *Ravian* Method, as he had promiſed, and I expected; but he only endeavours to prove throughout the whole Book, the Method he wrote of was the beſt, that RAVIUS invented it, and that he himſelf ſucceſsfully perſormed it.

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in many Caſes be ſooner performed than the lateral Method; as when the Stone cannot be readily found by reaſon of its Smallneſs, or when it lies concealed in ſome Sulcus or Cavity [a] of the Bladder on either Side, or behind the *Oſſa pubis*; whereas in the high Operation it may be no leſs expeditiouſly found, than extracted, as there is in that Method Room enough to ſearch into every Part of the Bladder with the Fingers, which are of all Inſtruments the beſt Searchers and Extracters, eſpecially if an Aſſiſtant, by introducing his Fingers into the Patient's Anus, preſſes forwards the Bladder and Stone towards the Aperture; but tho' the Stone may be thus readily extracted by the Fingers, ſometimes aſſiſted with the Forceps or a Hook, in the high Operation, as DOUGLAS, CHESELDEN, and MORAND acknowledge; yet in the lateral Method and *Apparatus major*, the Surgeon is often a long Time ſearching with the Forceps for the Stone in the dark, and often ſtill longer in extracting it.

XVII. The third Objection ſtarted by M. DENYS is, that the high Operation for the Stone is more painful than the lateral Method [b]. But this does not appear to be true, nor could I ever obſerve that there is any thing in it; but, on the contrary, I have often ſeen Children make but little Clamour from the Pain of this Method, in Compariſon with what they often make in the lateral Operation, and upon other Occaſions. This indeed muſt be confeſſed, that when the Stone is very large, and alſo rough, it then gives the Patient moſt excruciating Pain; but then this is an Inconvenience that attends all the Methods, but the high Operation leſs than the reſt, as may appear from the large Stone thus extracted, which is repreſented at *Fig.* 1 and 2, of our Diſſertation *de Alto Apparatu*, in the Extraction of which the Patient ſeemed to have little or no Pain, in Compariſon of what they frequently ſuffer in Lithotomy.

Third, that it is more painful.

XVIII. Laſtly, M. DENYS objects, that the high Operation cannot be performed on all Subjects, and eſpecially Infants and Children, becauſe of the Smallneſs of their Bladders. But the Operation is ſo far from being difficultly performed on thoſe Subjects, that when it is executed by a judicious Hand, it generally ſucceeds the beſt; Inſtances of which may be ſeen in DOUGLAS, CHESELDEN, MORAND, MIDDLETON, and others, upon Boys of only three or four Years old [c]. But, what ſeems a little more reaſonable, he objects, (*pag.* 99 to 105.) with GARENGEOT, and ſome others [d], that it is neceſſary, in the high Operation, to diſtend the Bladder ſo much with Water, that it may aſcend a good Way above the *Oſſa pubis*, which cannot be done where the Bladder is ſmall and thick; and that therefore this Method cannot ſucceed in all Patients. The high Operation may indeed be more expeditiouſly and ſecurely performed when the Bladder is previouſly well diſtended with ſome Liquor; but I have before taken notice, that if the Bladder cannot be conveniently in this manner diſtended, as it is not abſolutely neceſſary, the Operation may be performed with Caution, when it is but moderately diſtended, or even when it is wholly

Fourth, that it cannot be perform'd on ſmall Bladders.

[a] *Fovea*, or Cavities in the Bladder capable of intercepting the Stone, may be ſeen in *Tab.* XXXII. *Fig.* 1 & 2, as I once found them in a dead Subject; an Obſervation of the ſame kind hath been given us by RIOLAN and others.

[b] Loc. cit. *pag.* 99.

[c] Vid. COLOT in *Præf.* pag. 37. where he tells us he has cut Children of eighteen Months old by this Method.

[d] Operat. Chirurg. *pag.* 280. T. II.

NYS, Surgeon and Lithotomiſt at *Leyden*, who was formerly Aſſiſtant to M. RAW, or RAVIUS when alive, and ſucceeded him in Lithotomy upon his Deceaſe, being at preſent a ſtrenuous Defender of his Method, tells us [a], that the high Operation is in many Caſes impracticable upon many accounts, and that thoſe Patients, who cannot be freed from the Stone by that Method, might yet be cured by the lateral Operation of RAW. But I ſhould have deſired that Gentleman firſt to have demonſtrated, or ſpecified ſome of thoſe many Caſes wherein he aſſerts the high Operation to be impracticable, and then to have proved it by inſtancing an Example in Practice, in which the Stone could not be extracted by the high Operation, and was afterwards effected notwithſtanding by the lateral Method of RAW. For my own part I can find no ſuch Example; but, on the contrary, I have before obſerved, that I extracted the Stone from two Patients by the high Operation, when I could not effect the ſame *in perinæo* by the lateral Method, notwithſtanding I might ſafely affirm myſelf perfectly verſed in the Practice of it. M. DENYS indeed tells us of a Caſe, in which RAW could not extract the Stone by the high Operation, (*pag.* 69 & 71.) and of another (*p.* 91, 92.) that happened to the eminent Lithotomiſt of *Amſterdam*, BORTELIUS; by which laſt I have often ſeen this very Method performed with great Parade and Dexterity. The laſt mentioned Lithotomiſt indeed grants, that the high Operation may be ſucceſsfully performed too upon young Children, (and therefore he does not diſapprove of it;) but that it cannot well be performed upon all, eſpecially young Infants. But even among theſe I muſt again ſay, that I never yet met with an Inſtance where the high Operation was performed, and the Patient could not be freed from the Stone thereby, though it has in ſome Caſes been very large, (ſee *Tab.* XXXII. *Fig.* 6.) and therefore ſuch Inſtances ought to have been produced; whereas, on the contrary, there are many Caſes in which the Stone could not be extracted by the other Methods of Lithotomy.

First Objection, that it is often impracticable.

XVI. The Second Objection raiſed by the ſame Author againſt the high Operation is, that it takes up a longer Time in the Performance than the lateral Method, (in *Pref.* pag. 5, & 99.) But if we except the previous Diſtenſion of the Bladder, by filling it with ſome Liquor, the Inciſion itſelf, and Extraction of the Stone, may be performed in as ſhort a Time as in the *Apparatus major*, and lateral Operation, if nothing extraordinary ſhould hinder; and it is apparent to every one, that the filling of the Bladder is not the Operation, but only one of the preparatory Requiſites in the *Apparatus*. We alſo obſerve, that, in the lateral Operation and the *Apparatus major*, Obſtacles frequently occur, which greatly impede and prolong the Operation, even as M. DENYS himſelf has confeſſed, by relating ſome Obſervations on this Head, particularly (*pag.* 57.) that M. RAW was one Time three Quarters of an Hour in ſearching after, and extracting the Stone. In ſhort, I may boldly aſſert, that the high Operation may

Second Objection, that it is longer in performing than the lateral Method.

[a] In Obſ. Chirurg, de Calculo & Lithotomia, An. 1731. in Pref. *p.* 4. In which Preface he aſſerts, that he publiſhed the Book to favour the World with what Obſervations he had made in the Practice of the Lateral Operation of RAVIUS; and the ſame thing he repeats again in the Beginning of his Treatiſe, *page* 2. But all this he ſays without doing it; for he does not ſo much as give us a full Deſcription of the *Ravian* Method, as he had promiſed, and I expected; but he only endeavours to prove throughout the whole Book, the Method he wrote of was the beſt, that RAVIUS invented it, and that he himſelf ſucceſsfully perſormed it.

in

in many Caſes be ſooner performed than the lateral Method; as when the Stone cannot be readily found by reaſon of its Smallneſs, or when it lies concealed in ſome Sulcus or Cavity [a] of the Bladder on either Side, or behind the *Oſſa pubis*; whereas in the high Operation it may be no leſs expeditiouſly found, than extracted, as there is in that Method Room enough to ſearch into every Part of the Bladder with the Fingers, which are of all Inſtruments the beſt Searchers and Extracters, eſpecially if an Aſſiſtant, by introducing his Fingers into the Patient's Anus, preſſes forwards the Bladder and Stone towards the Aperture; but tho' the Stone may be thus readily extracted by the Fingers, ſometimes aſſiſted with the Forceps or a Hook, in the high Operation, as DOUGLAS, CHESELDEN, and MORAND acknowledge; yet in the lateral Method and *Apparatus major*, the Surgeon is often a long Time ſearching with the Forceps for the Stone in the dark, and often ſtill longer in extracting it.

XVII. The third Objection ſtarted by M. DENYS is, that the high Operation for the Stone is more painful than the lateral Method [b]. But this does not appear to be true, nor could I ever obſerve that there is any thing in it; but, on the contrary, I have often ſeen Children make but little Clamour from the Pain of this Method, in Compariſon with what they often make in the lateral Operation, and upon other Occaſions. This indeed muſt be confeſſed, that when the Stone is very large, and alſo rough, it then gives the Patient moſt excruciating Pain; but then this is an Inconvenience that attends all the Methods, but the high Operation leſs than the reſt, as may appear from the large Stone thus extracted, which is repreſented at *Fig.* 1 and 2, of our Diſſertation *de Alto Apparatu*, in the Extraction of which the Patient ſeemed to have little or no Pain, in Compariſon of what they frequently ſuffer in Lithotomy.

Third, that it is more painful.

XVIII. Laſtly, M. DENYS objects, that the high Operation cannot be performed on all Subjects, and eſpecially Infants and Children, becauſe of the Smallneſs of their Bladders. But the Operation is ſo far from being difficultly performed on thoſe Subjects, that when it is executed by a judicious Hand, it generally ſucceeds the beſt; Inſtances of which may be ſeen in DOUGLAS, CHESELDEN, MORAND, MIDDLETON, and others, upon Boys of only three or four Years old [c]. But, what ſeems a little more reaſonable, he objects, (*pag.* 99 to 105.) with GARENGEOT, and ſome others [d], that it is neceſſary, in the high Operation, to diſtend the Bladder ſo much with Water, that it may aſcend a good Way above the *Oſſa pubis*, which cannot be done where the Bladder is ſmall and thick; and that therefore this Method cannot ſucceed in all Patients. The high Operation may indeed be more expeditiouſly and ſecurely performed when the Bladder is previouſly well diſtended with ſome Liquor; but I have before taken notice, that if the Bladder cannot be conveniently in this manner diſtended, as it is not abſolutely neceſſary, the Operation may be performed with Caution, when it is but moderately diſtended, or even when it is wholly

Fourth, that it cannot be perform'd on ſmall Bladders.

[a] *Fovea*, or Cavities in the Bladder capable of intercepting the Stone, may be ſeen in *Tab.* XXXII. *Fig.* 1 & 2, as I once found them in a dead Subject; an Obſervation of the ſame kind hath been given us by RIOLAN and others.

[b] Loc. cit. *pag.* 99.

[c] Vid. COLOT in *Præf.* pag. 37. where he tells us he has cut Children of eighteen Months old by this Method.

[d] Operat. Chirurg. *pag.* 280. T. II.

collapſed; therefore this Preparation ought not to be eſteemed as an Incumbrance to the Operation, it being only a Precaution for the more ſafe Performance of it. For you may obſerve, that there was none of this Diſtenſion of the Bladder made in any of the Caſes, where the Stone could not be extracted by the Wound firſt made *in perinæo* by FRANCUS and ROSSET, and yet we find that the Stone was happily this Way taken from the collapſed Bladder, without either wounding its Fundus, or the Peritonæum. Thus alſo the Operation has been ſucceſsfully performed by PROBISCHIUS[a] and myſelf, barely by cauſing the Urine to be retained, by making a ſlight Stricture on the Urethra, after plentiful drinking of Tea, and without injecting any Liquor by the Urethra[b]: Not to mention the Inſtances recited by BERRIERE, MORAND, and others, in which the Bladder has been rightly inciſed, and the Stone happily extracted, when the Bladder could not be thus diſtended with any Liquor, thro' the Clamours of the Children, who were not above four Years old.

Other Objections to this Method.

XIX. Moreover, M. DENYS objects, that after the Bladder has been filled, the Penis is obliged to be ſtrongly compreſſed either by the Fingers, or a Ligature, to prevent the Reflux of the Water before the Bladder is inciſed, by which means will be brought on Tumor, Inflammation, and other bad Symptoms. But I muſt declare, that no ſuch bad Symptoms have ever appeared under my Obſervation, nor can I imagine how they ſhould, ſince a very ſlight or gentle Compreſſure will be ſufficient to reſtrain the Liquor in the Bladder, which may be commodiouſly performed, as we before obſerved, by the Steel-Inſtrument, *Tab.* XXVI. *Fig.* 9. termed a Yoke, deſigned for an Incontinency of Urine. An Inſtrument of the like kind has been alſo recommended by M. WINSLOW for the ſame purpoſe, which is delineated in NUCKE's *Chirurgical Operations*, *Fig.* 11. and may be ſeen in our Surgery, *Tab.* XXVI. *Fig.* 10. The next Objection is, that the Patient, treated by the high Operation, is obliged to lie conſtantly on his Back. But this is not true; for they may often turn themſelves, and lie on their Sides or Belly, if they have a mind. Which laſt is ſometimes recommended by DOUGLAS, WINSLOW, MORAND, and others, eſpecially after the Parts have been ſuppurated, in order to promote the Agglutination of the Lips of the Wound. In the laſt Place he objects, that Sand and Fragments of the Stone cannot be ſo well extracted in this, as by the lateral Operation. But what is much more advantageous, there need not, in this Method, be any Fragments broke off from the Stone, ſince the Inciſion is made very large, and the Stone generally extracted with no great Violence by the Fingers only; inſomuch that I judge it to be one of the principal Advantages of the high Operation, as I have before demonſtrated, that the Bladder may be thereby more perfectly cleanſed from calculous Fragments and ſmall Stones, if ſuch there ſhould be, than by any other Method of Lithotomy; for that ſuch Fragments and ſmall Calculi are very difficultly extracted by the *Apparatus major* and lateral Operation, is even acknowledged by M. DENYS himſelf; whereas in the high Operation, when the Bladder is elevated by an Aſſiſtant, the Stone may

[a] See my Diſſert *de Alto Apparatu*, pag. 53.

[b] This Method of diſtending the Bladder by retaining the Urine, has been much recommended by M. WINSLOW in *Morandi Lib. de Alt. Ap.* p. 319. more eſpecially if the Patient had uſed himſelf to retain his Urine a long Time for ſeveral Days before.

be very readily found and extracted, either by the Fingers or convenient Inſtruments, which cannot be ſo readily done in any other Method as in this, by the univerſal Conſent and Declaration of all Lithotomiſts, who have treated on the Subject. In *pag.* 118. M. DENYS aſſerts, that the Patients treated by the high Operation are afterwards troubled with an Incontinency of Urine, which is abſolutely repugnant to the Experience both of myſelf and others. In ſhort, all the Advantages which this Author attributes to the lateral Method of RAVIUS in *pag.* 119. may be alſo juſtly aſſerted of the high Operation; and M. LE DRAN confeſſes, that large Stones may be more ſecurely this Way extracted, than by the *Apparatus major*, before which Method the high Operation is alſo preferred by Mr. CHESELDEN on ſeveral accounts.

In what Caſes this Method is leſs convenient.

XX. But leſt any body ſhould think, that I only approve of and practiſe the high Operation, and deſpiſe all the other Methods of Lithotomy; I ſhall conclude this Chapter by enumerating briefly the Caſes in which it is leſs convenient than the other Methods. And, firſt, it appears from the Experience of myſelf and others, that this Method of Lithotomy is not ſucceſsful in old Men, or even ſuch as have paſſed their thirtieth Year, as ſuch ſeldom recover according to MIDDLETON, DOUGLAS, and others, and, to mention no more than M. SMITH, *pag.* 91. whoſe Words, in this reſpect, are very remarkable, *viz.* that *all above thirty or forty Years old, who have undergone this Operation, have died, except one*; and I myſelf have cut four, whoſe Age has exceeded thoſe Years, but none of them recovered. The high Operation is alſo ſeldom attended with Succeſs, when the Patient is previouſly afflicted with ſome other Diſeaſe, eſpecially thoſe who have an Ulcer in their Kidneys or Bladder, have been reduced with a Conſumption, or have a ſchirrous Bladder; in all which Caſes the Methods of cutting *in perinæo* are allowed to be preferable to the high Operation by all the Lithotomiſts who have treated on the Subject; becauſe by the lower Methods the Bladder may be more eaſily cleanſed and conſolidated, beſides which, the ſame is confirmed by daily Experience, which ought always to be regarded as the beſt Maſter. Laſtly, the high Operation is more difficultly performed than the other Methods upon ſuch Subjects as have ſmall Bladders, which may be known partly from their containing but a ſmall Quantity of Urine, and partly from the Difficulty of moving the Catheter in the Bladder; in theſe Circumſtances I ſhould therefore adviſe one, who is not expert in performing this Operation while the Bladder is flaccid, without injuring its Fundus, or the Peritonæum, to chuſe ſome other Method. However, the Operation is not impracticable in ſmall Bladders, as ſome would have us believe. From hence it is ſufficiently apparent, that, according to the different Diſpoſition of the Patient's Habit, State of his Bladder, the Stone, and other Circumſtances, a prudent Surgeon will ſometimes prefer one Method, and ſometimes another, according as it ſhall appear more or leſs convenient. But if any one is deſirous of ſeeing more concerning the high Operation, they may conſult DOUGLAS, MIDDLETON, CHESELDEN, ROSSET, MORAND, LE DRAN, and GARENGEOT, who have more largely treated of the Subject: To theſe they may alſo add my Diſſertation *de Apparatu Alto*, which was publiſhed at *Helmſtadt* in the Year 1728.

An

An EXPLANATION *of the* THIRTIETH PLATE.

Fig. 1, 2, & 3, are taken from Mr. CHESELDEN's Treatiſe of the high Operation, in order to ſhew the Poſition and State of the Bladder when diſtended with Liquor, preparatory to the Operation. But as theſe Figures have been explained at large in N°. IX, of this Chapter, we ſhall refer our Reader thither, to avoid troubling him with a ſecond Repetition.

Fig. 4. Repreſents the Abdomen opened, the Bladder being moderately, or but little diſtended, either by the Urine or ſome Liquor, that hereby may appear how ſmall a Space there is then remaining betwixt the *Oſſa pubis* and Fundus of the Bladder covered with the Peritonæum, being the Part to be inciſed by the Lithotomiſt; but a more particular Explanation may be ſeen in the Place but now mentioned.

Fig. 5. Denotes the Pipe or Tube, by which the Liquor is to be conveyed into the Bladder, in order to diſtend it for the Operation, which is alſo taken from Mr. CHESELDEN. A A is a Silver Catheter, which is paſſed thro' the Urethra into the Bladder. B the Aperture in each Side by which the injected Liquor enters the Bladder. C a Braſs-pipe which is to be adapted to a ſizable Syringe. D D D a flexible Pipe made of Leather, or an Ureter of an Ox, by means of which the inflexible Tube and Catheter are joined to each other; and thus the Injection may be more eaſily performed, than if the whole was an inflexible Tube, ſuch as was in Uſe with ROSSETUS. E the Part of the flexible Tube, which is tied with a Thread to the Catheter, where there is alſo a tranſverſe Handle, which ſerves to hold the Catheter ſteady, that it may not hurt the Patient during the Injection.

Fig. 6. Repreſents the Pouch or Caſe for holding the ſeveral Inſtruments for Lithotomiſts, diſpoſed in their proper Order. This is to be faſtened round the Lithotomiſt in the manner repreſented at *Fig.* 9. *Tab.* XXIX, and was always uſed by RAVIUS, as being more ready and expeditious, than to truſt to an Aſſiſtant, who may chance to be attending ſomething elſe. A A A A the Pouch itſelf, B B the Inſtruments diſpoſed in their proper Order, C C the Side or Cover to the Caſe, which may be faſtened with the Buttons marked D D, that ſo the Inſtruments may be concealed from the Patient's Sight, that they may not deter him; E E the Strings by which the whole is faſtened round the Waiſt of the Lithotomiſt.

CHAP. CXLIII.

Concerning the Artifices uſed by Frier JAMES, (Frere Jaques) *in cutting for the Stone; as alſo on the* lateral Operation *of* RAVIUS.

A Deſcription of the Perſon and Reception of JAMES at *Paris.*

I. ABOUT the End of the laſt Century there was a famous *French* Lithotomiſt, named FRERE JAQUES, who, at that Time, frequently performing that Operation in a peculiar manner, was the Subject of every one's Thoughts and Diſcourſe; and even 'till this Day he has been ſo much talked of

Fig. 5.

Fig. 1.

Fig. 2.

Fig. 4.

Fig. 3.

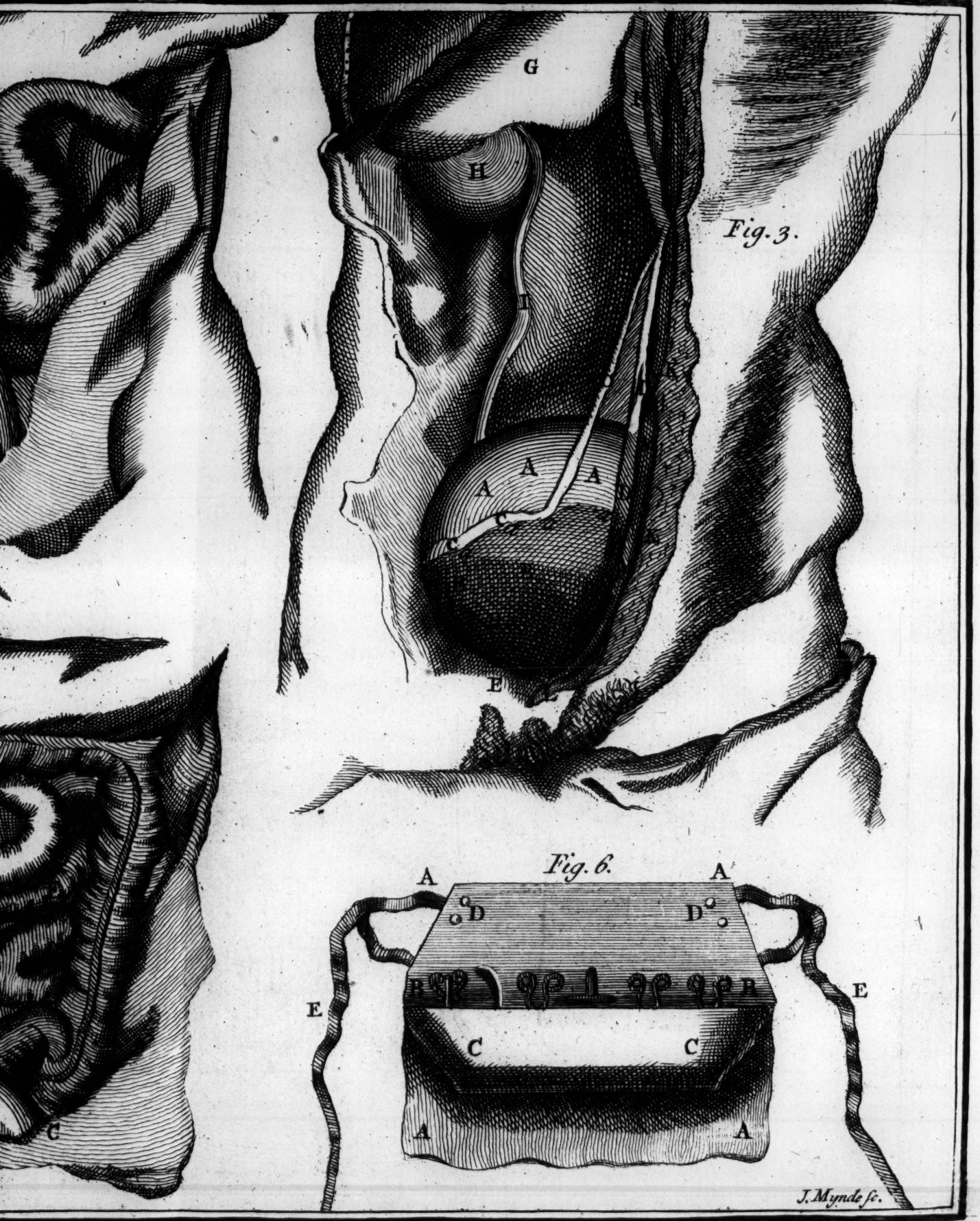

Fig. 6.

J. Mynde sc.

of among Surgeons and Lithotomiſts, that we cannot well paſs him by in Silence, without taking notice both of him and his Method, with the new Artifices which he introduced in Lithotomy. About the Year 1697 this Perſon, who was an obſcure Monk, or Hermit, as ſome call him, came to *Paris* from ſome of the Outparts of [a] *France* in a very miſerable Condition, being both deſtitute of Money, Victuals, and Clothes; but of an open and free Temper, his Simplicity of Mind being judged commendable by ſome of the *French* Writers. Here he produced and ſhewed almoſt every Body the many Teſtimonies of Patients that he had happily cut and cured by his ſafe and ready Method in the ſeveral Provinces of *France*; and tho' his Artifices were yet unknown to any of the Surgeons, he made no Secret of 'em. As for the Reward of his Labour, he required none, or at moſt but very little, as much as would repair his Inſtruments, pay for the mending of his Shoes, or the like. At length he addreſſes himſelf to the chief Surgeons and Phyſicians of the *French* King at *Paris*, deſiring that he might have the Liberty of cutting and curing ſuch Patients as were afflicted with the Stone in that City, and the great Hoſpitals, by his new and as yet unheard-of Method; at the ſame Time ſtrenuouſly aſſerting, that his chief Deſign, in coming to *Paris*, was to teach them a better Method of cutting for the Stone. Hereupon the Surgeons, and particularly the Lithotomiſts, were highly diſpleaſed, that JAMES ſhould put himſelf upon a Par with themſelves; but being taken with the Addreſs and Novelty of the thing, and partly out of Curioſity, they permitted him to perform the Operation firſt upon a dead Subject, that had a Stone conveyed into the Bladder.

His firſt Operation on a dead Subject.

II. The dead Subject being made ready, and many Surgeons and Phyſicians preſent, JAMES began his Operation in the following Manner: Firſt, the Body being laid and ſecured in the uſual Poſture upon the Table, he then paſſed an ordinary, or common tubulated (not the grooved) Catheter into the Bladder in the uſual Method, and therewith he extruded the Side of the Bladder in the left Part of the Perinæum; after which he made an Inciſion with a Knife a little longer than the common Biſtoury, near the Perinæum, but in a manner ſomewhat different from the common Practice; for guiding the Knife upwards from the Anus, near which he had entered it, he divided the Parts nearly in a right Line, in the left Side of the Perinæum, about two Fingers Breadth from its Raphe or Suture, the Inciſion reaching obliquely up to about the middle of the Perinæum, in which he cut through the Neck of the Bladder, and Part of the Bladder itſelf, without injuring any other Part of the Urethra, then paſſing his Finger through the Wound into the Bladder, he ſearched for the Seat of the Stone; which done, he paſſed an Inſtrument like a Spoon through the Wound, and having thereby introduced a Pair of Stone-forceps into the Bladder, he extracted the Spoon or Conductor; and, having laid hold of the Stone with the Forceps, he alſo extracted the ſame very dextrouſly, to the great Admiration of the Spectators, notwithſtanding the Stone was nearly as big as a common Hen's Egg.

The Judgment paſſed on his Operation.

III. The Operation being thus concluded, the Surgeons, upon inſpecting the Body, found, that this new Lithotomiſt had firſt cut thro' the common Integu-

[a] Some tell us his Name was BEAULIEU, of *Beſançon* in the County of *Franche*; others ſay of *Beaufort*, a Town near *Beſançon*.

ments

ments of the Perinæum to about the Length of two Fingers Breadth; that the Wound next paſſed betwixt the Accelerator and Erector-muſcle of the Penis, without injuring either of them, till it had reached and penetrated the Neck of the Bladder, and Part of its Body in a right Line for about an Inch; and, laſtly, that he had extracted the Stone through this Inciſion. The Particulars of the Caſe being duly conſidered, ſeveral of the moſt prudent Phyſicians there preſent, and particularly MERIUS, could not help thinking, that this new Method of Lithotomy was much preferable to the Method of cutting by the *Apparatus major*, and muſt be attended with leſs Danger; becauſe in the common Method of cutting by the *Apparatus major*, it is not only neceſſary to divide the Urethra, but the Neck of the Bladder and its narrow Sphincter, together with the proſtrate Gland, are alſo violently dilated and contuſed; and then again, if the Stone ſhould be conſiderably large, thoſe Parts muſt be ſtill further injured by the Violence uſed for its Extraction. However, as the Majority of the moſt eminent Surgeons and Lithotomiſts were not fond of promoting new Methods introduced by inferior Hands, we need not wonder that they would not permit the new Lithotomiſt to perform his Operation on a living Patient.

JAMES next cuts for the Stone upon a living Subject.

IV. JAMES finding himſelf thus coldly received by the *Pariſians*, addreſſes himſelf to the King's Surgeons and Phyſicians, who then reſided with the Court at *Fontainebleau*, and to them he ſhews his Letters of Recommendation, and Teſtimonies of Patients, that he had happily cured by cutting, in the ſeveral Parts of *France*, requeſting of them that he might be permitted to perform his new Method of Lithotomy upon a certain young Man a Taylor, there afflicted with the Stone, which Requeſt was immediately granted; and JAMES performed the Operation according to the preceeding Method, ſo ſucceſsfully before the King's Phyſicians and Surgeons, that, to his great Applauſe, the Patient was, in leſs than three Weeks time, ſeen walking about in the *Areas*, and troubled with none of the bad Symptoms, which uſually attended the common Method of cutting.

And hereby acquires a great Reputation.

V. This lucky Inſtance of his Succeſs brought JAMES to be taken notice of, and reſpected by every-body, not excepting the King himſelf, and made moſt of the *Pariſians* look upon him as a Phyſician ſent from Heaven for the Relief of Mankind, by his new and better Method of Lithotomy. Therefore in the Spring following, *Anno* 1698, being furniſhed with the King's Licence, he returned to *Paris*, and performed his Operation upon a great Number of Patients, being always attended with ſuch a Crowd of Spectators, that at laſt it became neceſſary to have a Guard of Soldiers to keep the Tumult in Order.

His Treatment of the Patients.

VI. It is to be obſerved, that JAMES never uſed any manner of preparing his Patients for the Operation by Bleeding, Purging, Diet, or proper Regimen, as was cuſtomary with other prudent Surgeons and Lithotomiſts: Nor did he uſe any Ligatures to ſecure the Patient, as they did in the other Methods; but the Patient being laid on a Table, with his Legs bent upward, was ſecured by the Hands of ſtrong Aſſiſtants only. In his Extraction of the Stone, he was, by the Report of DIONIS and others [a], ſo intrepid, or rather cruel, that it

[a] In his Surgery, under the Chapter of Lithotomy. And the ſame is alſo affirmed by Dr. LISTER in his Journey to *Paris*, and SAVIARD, Obſ. *pag.* 454.

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ſtruck a Horror into moſt of the Surgeons preſent, who, tho' they were Men of Courage in their Profeſſion, could not avoid being under Pain for the Patient's labouring under the Severity of his Hand. And, in like manner, he was ſo careleſs with regard to dreſſing, and binding up the Wound after the Operation, and ordering a proper Regimen, that, when the Patients deſired him to take care of them in thoſe reſpects, his Anſwer was generally: "It is ſufficient that I have "extracted the Stone, GOD himſelf will cure the Wound" [a]. He treated Women, that had the Stone, in the ſame manner as he did Men, without the leaſt Difference, only he generally wounded their Vagina in cutting them; but that, ſays he, is a Matter of no conſequence, it is rather what ſhould be done.

The Event of his Operations.

VII. But, in order to form a better Judgment of his whole Proceedings in Lithotomy, it will be neceſſary to conſider what was uſually the ultimate Event of his Operations, which will generally appear with no good Aſpect. If we may believe MERIUS (who was at that Time a celebrated Surgeon in *Paris*, and wrote a laudable Diſſertation upon the whole Affair in *French*, which he publiſhed at *Paris* in the Year 1700.) out of ſixty calculous Patients, which were cut by him in the Spring of the ſame Year, twenty-five of them periſhed, only thirteen of them were cured, and the Remainder of them were left with a Fiſtula, or an Incontinency of Urine. And M. DIONIS in his Surgery [b] writes, ſeven Years after MERIUS, that, in his Time, more than half the Patients, which had been cut, and paſſed for being cured of the Stone by JAMES, were ſince deceaſed of the various ſupervening Symptoms; and that the Method of cutting uſed by him was ſo cruel and imprudent, that it was no Wonder if every one of them had expired. And to add Authority to his Sentence, M. DIONIS alledges, for an Inſtance, the young Man, a Taylor, which, as we before mentioned, was the firſt that JAMES cut for the Stone at *Fontainbleau*; and though it was thro' him that JAMES acquired ſo much Reputation, yet the Patient was not only ever after troubled with a Fiſtula *in perinæo*; but his Conſtitution and Body thereby gradually waſting and decaying, there was not two Years paſſed before he exchanged a miſerable Life for a more welcome Death. Whereas the ſame M. DIONIS aſſures us, that, of twenty-two Patients which were cut for the Stone in the ſame Spring by other Hands, there were only three of them loſt, almoſt every one of the reſt being perfectly reſtored to their former Health.

The Reſult of inſpecting his dead Patients.

VIII. Upon opening and inſpecting the dead Subjects, which had been cut for the Stone by JAMES, it was obſerved by the fore-mentioned reputable Authors, that the Bladder was very often cut quite off from the Urethra; in others they found a Cancer, or an incipient Mortification of the Bladder and Inteſtines; and in others again they found, that the Muſcles, Nerves, and Blood-veſſels of the Penis had been divided by the Knife [c]. In ſome, the elevating Muſcle of the Anus and Blood-veſſels from the Hypogaſtrics were ſeen cut in ſunder; in others, the Back-part of the Bladder was obſerved three or four

[a] *Je lui ay tiré la pierre; Dieu le guerira.*
[b] Publiſhed in the Year 1707 in 8vo at *Paris*.
[c] Many more Obſervations relating to this Effect may be ſeen made in Dr. MARTIN LISTER's Journey to *Paris*, 8vo *Lond.* 1699

times perforated towards the Cavity of the Abdomen; and in others again, the Wound of the Bladder appeared unequal, lacerated and diſtorted. In ſome Patients he perforated the Rectum, ſo that the Fæces were diſcharged through the Wound; and in ſeveral Women which he cut, he not only wounded the Bladder, but alſo the *Vagina* and *Inteſtinum rectum*, ſo that it was no Wonder ſeveral of them had a Diſcharge of their Fæces thro' the *Vagina*. And, laſtly, by his wounding ſome of the adjacent large Blood-veſſels, there followed ſuch a Profuſion of Blood, that the Patient ſometimes expired, either under the Knife, or ſoon after the Operation.

His other Errors.

IX. Nor did he always obſerve, to make his Inciſion in the ſame Place, when he cut for the Stone; but he would ſometimes divide the Perinæum above an Inch higher or lower than he did at others; ſo that thro' his Inconſtancy and Negligence it was almoſt impoſſible for him to avoid injuring ſome Part or other, which ought not to be touched, every Time he performed the Operation. Beſides, what is always a great Impediment to the Practice of Surgery, he was often ſo unprovided with ſuitable Inſtruments, that he has ſometimes uſed a common Razor to cut for the Stone, inſtead of the Inciſion-knife proper for a Lithotomiſt. And I myſelf have heard the *Dutch* People ſay, while I was in *Holland*, that when our Lithotomiſt came thither from *France*, he at firſt cut a great Number for the Stone, and would ſometimes uſe a common blunt Knife to perform the Operation, when his own Inciſion-knife was not at hand; and if that be the Caſe, it is no Wonder, that his Patients were ſo conſtantly expoſed to the moſt malignant Symptoms, and grievous Diſorders. Alſo while he was at *Paris*, in a Lad troubled with the Stone, the Calculus fixed itſelf in the Cavity of the Urethra immediately behind the Scrotum *in perinæo*, notwithſtanding which he obſtinately cut him according to his uſual Method, near the Anus; when it would have been much more commodious to have done it, like other prudent Surgeons, in that Part of the Perinæum, where the Stone offered itſelf. Theſe, and the like Circumſtances, inſtead of demonſtrating him to be a rational and prudent Lithotomiſt, proved that he was no more than a raſh and empirical Practiſer; which is ſtill more ſtrongly confirmed, by his being totally ignorant of every thing in Anatomy, and of every Operation in Surgery; unleſs that he would ſometimes undertake the Cure of Ruptures by the Knife, when they occurred to him. But as in that Operation he always deprived the Patient of his Teſticle, without any Neceſſity, like the generality of Mountebanks; it is thence more than probable, that he learnt his imprudent Artifices of ſome Empirick or Quack; for he would never, that I could hear of, reveal where he learnt his Art[a].

[a] M. Meri tells us *(in Obſ. de Methodo* Jacobi, *pag.* 43.) that he learned his Art formerly of ſome Phyſician, whom I take to have been ſome itinerant Surgeon, or Mountebank, perhaps not altogether ſo ignorant as James, who perhaps from his own Imagination, and the reading of Celsus, or Guido, contrived and practiſed this new Method of Lithotomy, together with Celotomy; and James being a Servant to him, and often aſſiſting in the Operations, was afterwards bold and raſh enough to attempt the ſame himſelf, tho' utterly ignorant of Anatomy, and every other neceſſary Qualification. An Inſtance of the like kind is ſtill within my Remembrance, of a Mountebank that, among other Places, uſed the Fares at *Francfort* in *Germany*, who had a Servant to look after his Horſes; but the Fellow being ſtrong, he often employed him in holding the Patients during his Performance of the Operation for Ruptures and Lithotomy; at length, thinking he had ſeen enough, he deſerted his Maſter's Service, and ſet up for an Operator, tho' perfumed with the Stables, and with Succeſs anſwerable.

X. James

JAMES now begins to come into Diſgrace.

X. JAMES having thus imprudently treated ſuch a Number of Patients with the very worſt Succeſs; and ſo conſiderable a Perſon as the Marſhal *de Lorye*, being almoſt dead, the Day after he was cut, with the moſt excruciating Pains, but happily preſerved by the Aſſiſtance of M. FAGON, the chief Phyſician, and a prudent Surgeon; it naturally followed, that the Reputation of our new Lithotomiſt began now to be turned into Diſgrace, inſomuch that the generality of the *Pariſians* quickly pronounced him a very ignorant and imprudent Operator. He therefore quitted thoſe Quarters; and, after travelling over moſt Parts of *France*, he came at laſt into *Holland*, particularly to *Amſterdam* and *Leyden*, and from thence he went thro' moſt of the principal Counties and Cities in *Germany*, performing his Operation in all of them, but generally with his former ill Succeſs. But what with his Raſhneſs and Cruelty, the Unfitneſs of his Inſtruments, and wilful Negligence, he could not eſtabliſh any Reputation in thoſe Parts, eſpecially for the firſt Years; ſo that he quite loſt the Name of a wiſe and prudent Surgeon, which he at firſt acquired. However, though Matters then run in ſo bad a Condition with him, it is worth obſerving, that he ſoon after began to alter and improve in his Operation, as I have been informed in a Letter from the celebrated Phyſician and Anatomiſt SALZMANNUS at *Straſburg*; he telling me, that JAMES had there made Emendations in his Method of Lithotomy; and that in the Year 1712, and in the Beginning of 1713, he had ſucceſsfully cut ſixteen Patients in that City, making uſe of a grooved Catheter; adding, that JAMES had ingenuouſly whiſpered him in the Ear, that he had laid aſide his former raſh Method of cutting; that he had abſtained from it above a Year; and that he now treated his Patients in a more judicious Manner. As theſe Circumſtances have been omitted by the generality, if not by all the Writers on this Subject, they are preſumed to be known but by few; and therefore I thought it would not be amiſs to inſert them here, that nothing might be wanting to compleat the Hiſtory of our Lithotomiſt. Agreeable with what I have before related, is the Account we find of JAMES, written by M. FEHRIUS, a Phyſician of *Switzerland*, in *Page* 23 of his Diſſertation *de Calculo Veſicæ, ejuſque per ſectionem auferendi Methodo noviſſima, præſtantiſſima & facillima*, publiſhed at *Baſil*, *Anno* 1716, in which we read, that out of ſixteen, who had been lately cut by JAMES at *Straſburg*, there was only one old Man who died, and that chiefly thro' Age, which was before predicted by him. In the ſame Treatiſe, *pag.* 17 *& ſeq.* we alſo meet with a very diſtinct Account and Deſcription of the lateral Operation of RAW, long before it was publiſhed by ALBINUS, as he had often ſeen it performed by that Lithotomiſt. Pretty much the ſame Account we alſo find of Frier JAMES's Reformation and Succeſs in Lithotomy at *Straſburg*, publiſhed by SCHAEFFERVS in a Diſſertation, *de variis Lithotomiæ Generibus*, pag. 24. printed at *Straſburg*, *Anno* 1724. In which he ought to have made the Time *Anno* 1712, inſtead of 1711, as SALZMANNUS obſerves. Much to the ſame effect alſo WEISBACHIUS[a], who had lived at *Straſburg*, tells us, that of twenty Patients which he had ſeen cut by JAMES, hardly one of them miſcarried, and that each of them obtained a preſent Cure without any remaining Fiſtula; but he neither mentions the Time

[b] In his *Medicina Practica, Cap. de Calculo*, written in the *German* Language, and publiſhed at *Straſburg* in the Year 1715, and ſince often reprinted.

when, nor the Place where, he had ſeen this; tho' I ſuppoſe it was at *Straſburg*, becauſe that had been the Place of his Reſidence [c].

On what account his Method was of Service.

XI. But however imprudent or raſh might be the Practice of JAMES in his Lithotomy originally, it is certain that his Method was of this Service, that it gave other more prudent Surgeons and Phyſicians a Hint of improving their Practice this Way more to the Advantage of Mankind. Thus from his Method of Lithotomy, as DIONIS rightly obſerves in the Chapter on that Subject, in his *Chirurgical Operations*, we were directed to improve and perfect the Operation of puncturing the Perinæum, to empty the Bladder in a Suppreſſion of Urine. For the Bladder itſelf might be much more ſafely and conveniently perforated by the Trochar, than its Neck, as was till then the Practice, which we ſhall conſider more particularly when we come to that Operation. And ſecondly, the Method of Lithotomy itſelf uſed by JAMES, might be performed to very good purpoſe by a prudent Surgeon, who is well ſkilled in the Anatomy of the Parts, notwithſtanding it ſucceeded ſo badly in the ignorant and raſh Hands of that firſt Operator. But we do not find that M. DIONIS has any where declared the manner of perfecting this Method of Lithotomy uſed by JAMES, and of avoiding his Errors.

It gave Occaſion for contriving a better Method.

XII. However, the celebrated Surgeon at *Paris* M. MERI made it his Buſineſs to publiſh a Treatiſe on this Method of Lithotomy, in order to perſuade Surgeons to come into the Practice of it; though, in a little while afterwards, he uſed all his Endeavours to diſſuade them from it again. But he propoſed it with this Improvement, that, inſtead of the common tubulated Catheter uſed by JAMES, the Operator ſhould cut upon a grooved Catheter, like that uſed in the *Apparatus major*. This grooved Catheter being paſſed into the Bladder, and then held in the left Hand, he ſays, is to be next thruſt outwards againſt the left Side of the Perinæum, as was the Practice of JAMES. The Lithotomiſt muſt then proceed to cut thro' the Perinæum into the Groove of the Catheter, with a proper Inciſion-knife, or Biſtory, like what is uſed in the *Apparatus major*, ſo as to divide the Neck of the Bladder with ſome Part of its Body which lies next to it, continuing the Inciſion cautiouſly onward, till the Aperture is big enough for the Extraction of the Stone. Through the Wound thus made, is to be introduced a hollow Conductor into the Bladder, termed by the *French* a *Gorgeret*, in the ſame manner as is uſual in the *Apparatus major*; and, laſtly, by introducing a Pair of convenient Forceps, the Stone itſelf is to be extracted. But tho' we muſt here confeſs M. MERI to be the firſt and real Improver of JAMES's Method of Lithotomy, yet we cannot ſay, that he ever made Trial of it upon any living Subject; but rather ſoon after he had made this Emendation, he a-

[c] It was therefore from *Straſburg* only that I was aſſured of JAMES's Succeſs in Lithotomy. But however prudent, or rather lucky, he might be in that City, it was not ſo with him at *Francfort on the Main*, in my own Country, as I was informed by an eminent Surgeon, and a Phyſician of that Place (namely GLADBACHIUS and SUTORIUS) in the Year 1713. For, during his Stay at that Place, which was from the Beginning of the Spring to September, he cut but two Patients for the Stone, and few for Ruptures, when, a few Days after the Operation, one of the firſt died in the publick Hoſpital; which made the Surgeons and Phyſicians at *Franckfort* entertain but a mean Opinion of his Skill; nay they even affirm, that he was a Man at that Time perfectly ignorant in the Sciences, and of good Manners; that he could ſcarce read or write, and did not ſo much as know how to apply a proper Dreſſing and Bandage to the Wound after his Operation; but of this more hereafter.

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gain rejected it, pronouncing it unſafe, and much inferior to the common Method by the *Apparatus major*. However, I believe he was the primary Occaſion of this Method being performed as he had corrected it, by the celebrated M. Mareschall, who cut by it with Succeſs at *Paris* not long after James; if we may rely on what we find written in Dr. Lister's Journey to *Paris* beforementioned; which Paſſage, in *pag.* 239, is ſo extraordinary, that it ſeems ſurprizing to me, that it was never taken notice of by any of the *French*, or even *Engliſh* Writers on the Subject[d]; I ſhall therefore relate the Affair as I find it in the ſaid Journey of Dr. Lister, which Account was given him after his Return from *Paris* to *London*, by another learned *Engliſhman* Mr. Probie, who ſtill reſided at *Paris*, and ſaw James cut for the Stone there in the Year 1698, *Auguſt* 2. when he ſent the Doctor the Letter now mentioned, in which we meet with the following Paſſage: "That the Surgeons of *Paris* "greatly ran down James, notwithſtanding they followed his Method. For "M. Mareschall had, from that Time, cut for the Stone according to "James's Method, with only this Difference, that he uſed a grooved, inſtead "of the common Catheter. And that M. Le Rue, another Surgeon of the "Hoſpital *La Charité* had, at the ſame Time, cut according to the old Me"thod; but not with ſuch good Succeſs as M. Mareschall had practiſed "the Method of James. For that all who had been cut by M. Mareshall "were then alive, and well; but that M. Le Rue had loſt ſeveral, and that "even thoſe who ſurvived his Method, were not ſo ſoon well as the others." But whether or no the ſame Method was continued, and often repeated by Mareschall, or others after him at *Paris*, we have no Accounts; at leaſt none that I hear of. It ſeems to me a little extraordinary, that none of the *French* Writers ſhould have taken any Notice of this Affair, ſince M. Mareschall died but a few Years ago, and ſaw the Operation that was firſt performed by Morand and Perchetus at *Paris* in 1730, according to Mr. Cheselden's Emendations, as Morand himſelf informs us, in *Memoir. Acad. Reg.* 1731. But M. Garengeot declares Perchetus to be the firſt that cut for the Stone by the lateral Operation after James at *Paris*. See his *Operat. Chirurg. T. II. pag.* 230. which may be beſt judged of and decided by the *French* Surgeons.

XIII. This new Method of Lithotomy was ſoon after corrected and revived in *Holland* by the celebrated *German* Phyſician Ravius, or Raw, whom I followed for ſome Time as my Preceptor in Surgery[e] and Anatomy, and with

Of the Ravian Method.

[d] Mr. Douglas is the only Perſon that has taken any Notice of Dr. Lister's Account in his Treatiſe on the *Lateral Operation*, pag. 37 and 39. But he does not thence infer, that M. Mareschall was the firſt who performed the Operation on a living Subject after James, which follows in conſequence of Dr. Lister's Words, if true.

[e] For from the Spring of 1706 to October of the Year 1710 I lived in *Holland*, and ſpent moſt of that five Years time in *Amſterdam*, where I diligently attended on the Operations of Ravius. This *Ravian* Method of Lithotomy was publiſhed with learned and juſt Recommendations in the Year 1725 by Albinus, Profeſſor of Anatomy and Surgery at *Leyden*, under the Title of *Index Supellectilis Anatomicæ*, together with a Deſcription of the Inſtruments to be uſed. However, the Scalpel, or Biſtory, repreſented by Albinus in *Tab.* I. *Fig.* 5. is quite different from that uſed by the Author when I was at *Amſterdam*, and that repreſented here in *Tab.* XXVII. *Fig.* 8. which I had of his Inſtrument-maker, whoſe Name and Mark is there the *Blue Bell*, as may be ſeen in the Figure; I therefore cannot ſee any Reaſon for his altering the Knife, ſince that which Albinus has repreſented, is not at all preferable to the original one of the Author.

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whoſe Name I ſuppoſe every body, that knows any thing of the Hiſtory of Phyſic, muſt be well acquainted. For RAW had not only often ſeen JAMES perform his Operation in *Holland*, as I have been informed by ALBINUS, both Father and Son, together with RUYSCH, who was another of my Maſters in Anatomy and Surgery, and as I have often underſtood from ſeveral other Phyſicians and Surgeons of *Amſterdam*; but he had alſo probably received an Account of the Emendations made in JAMES's Method by M. MERI, and the Account of MARESCHALL's Succeſs before mentionedin Dr. LISTER's Book; and being aſſiſted with a chirurgical Audacity, and great Skill in Anatomy, he firſt, like JAMES and the Ancients, cut through the Perinæum, and then through the Neck [f] and Bladder itſelf, which M. MERI aſſures us was the Method conſtantly firſt uſed by JAMES, and as I have often ſeen him perform it at *Amſterdam* [g]. RAW alſo made uſe of the grooved Catheter to cut upon, which M. MERI had recommended [h]; but, like JAMES, he had it made ſomewhat thicker than common. Then, inſtead of the *Gorgeret*, he uſed two enſiform Conductors, male and female, as in *Tab.* XXVIII. *Fig.* 2 and 3. But his Scalpel and Forceps were the ſame as in the common Method by the *Apparatus major*; and the Poſture in which he placed his Patients, was pretty much like that of JAMES [i], lying on their Backs with their Hips elevated; but then he ſecured them by Ligatures, in a manner differing from the common Method, which has been rightly deſcribed by few, and is generally altogether neglected by thoſe who have treated on his Method; tho' I muſt needs think it a very neceſſary Part in the Hiſtory of his Operation; and the more, as his Method of tying the Patient was not ſo terrifying as the common, which M. TOLET aſſerts to be the Occaſion of great Fear in the Patient, and M. WINSLOW even inſtances Death brought on by the Fright. See his Epiſt. *in* MORAND. *Lib. de Alto Apparatu.* Therefore, inſtead of the long Bandages which others uſed to put about the Patient's Neck and Limbs in ſo formidable a manner, RAW only applied two ſhort and flat Ligatures made of Flannel, (though they may be alſo compoſed of Silk or Linen) each of which were not above four Feet long. The Patient being laid on the Table repreſented in *Tab.* XXIX. *Fig.* 10. A, his right Wriſt was then faſtened with one of the Ligatures to the Leg of the ſame Side, not at the Ancle, as was the Practice of others, but to the Knee.

[f] As is remarked by ALBINUS, the Father, *in Oratione in Obitum* RAVII, *pag.* 29. tho' the Son, and DIONIS will have it, that he only divided the Bladder itſelf, without touching its Neck.

[g] When I at that Time, and afterwards often performed the Operation on dead Subjects, I always found, that I had divided, not only the Bladder, but alſo its Neck; but I then imagined myſelf in an Error, and ſuppoſed I did not know the Art of dividing the Bladder only.

[h] The Reaſon of the Catheter being thicker, or of a larger Diameter than the common, was, as RAW told me, that the Knife might the more readily paſs into its Groove, and not eaſily ſlip out of it again; tho' I am ignorant whether he made the ſame Remark public in any Diſſertation. Nor do I find upon a Compariſon made, that it was more incurvated than the common Catheters, as ALBINUS relates; for in the *Apparatus Major* there is required, and conſtantly uſed a very crooked Catheter, or of a large Curvature, as GARENGEOT expreſſes it.

[i] The Situation in which RAW diſpoſed his Patients for the Operation, is perhaps better deſcribed by ERNDELIUS in his *Iter Anglicum & Batavum*, pag. 119, than in any other Author; from whence we alſo learn, that RAW ſometimes placed his Patients on a little Box, or Cheſt, when his proper Table was not at hand; ſo that what GARENGEOT ſays in his Surgery, *Tom.* II. *pag.* 192. that RAW placed and bound his Patients in the ſame manner as for the *Apparatus Major*, is not true.

This

This Method of ſecuring the Patient is ſo peculiar to RAW, that it has been generally attributed, not to MERI or MARESHALL, but to him as the Author; and therefore it has been generally termed the RAVIAN Method of Lithotomy: But from the Time of publiſhing the famous Diſſertation of Dr. JAMES DOUGLAS upon the *Lateral Operation* at *London* in 1726, which was afterwards tranſlated from the *Engliſh* into *Latin* at *Leyden* in 1728. I ſay, from that Time it has been denominated the *Lateral Operation*; and ſince that, the Method has been performed, amended, and deſcribed by Mr. CHESELDEN at *London*, who alſo calls it the *lateral* Operation or Inciſion for the Stone; becauſe in that Method the Inciſion is made more on one Side of the Perinæum, and the Bladder is alſo inciſed laterally; whereas in the *Apparatus major* the Inciſion is made in the Urethra only.

XIV. Before I proceed to acquaint you with the Emendations which have been made at Times in this Operation, I ſhall firſt remark a few Particulars relating to the Author of it, and his manner of performing the ſame, according to my own Obſervation. Having finiſhed the Courſe of my Studies in *Germany*, and being taken with the Fame of the celebrated *Dutch* Profeſſors in Phyſic, I went next to *Holland*, and there ſtayed about five Years, to improve myſelf chiefly in Anatomy and Surgery, on which I had placed moſt of my Affections; and for the firſt Part of that Time I reſided at *Amſterdam*, continuing my Studies under RUYSCH and RAVIUS; but towards the latter Part of the Time, I began to teach other young Students in Anatomy and Surgery; ſo that I had at the ſame Time not only an Opportunity of ſeeing RAW perform his Operation, but I had alſo the Privilege of imitating him, and demonſtrating the ſame to others upon dead Subjects, ſince the publick Profeſſor and my Maſter RUYSCH had given me Liberty to diſſect dead Bodies in the Hoſpital, when I ſhould think proper, and apply them to chirurgical Uſes. By this means I became at length ſo expert in the Knowledge and Performance of the Operation, that I could hardly doubt of ſucceeding if I made Trial on a living Patient. Now in the Year 1709, when *Tournay* was beſieged by the united Provinces, I having been made Phyſician to the Camp, thro' the Recommendation of Profeſſor RUYSCH in the Year 1707, I therefore at that Time attended the Hoſpital erected for the Sick and Wounded at *Oudenarde*, where, among other Patients, I met with a Lad of about fifteen Years old, afflicted with the Stone in his Bladder, whom I cut, and freed from a Stone, weighing two Ounces, by the RAVIAN, or lateral Method of Lithotomy, in the Preſence of D. DE QUAURE, Surgeon in chief, with ſeveral others; and my Operation, which was performed in *Auguſt*, ſucceeded very happily. In the Year 1710 I was called to take up the Profeſſorſhip of Phyſic, Anatomy, and Surgery at *Altorf*; but then I firſt went over to *England*, and endeavoured to improve myſelf, by conferring with the moſt eminent Surgeons and Phyſicians at *London*, particularly CYPRIANUS, RUSSIERE, and LAVATERE, and, towards the End of the ſame Year, I returned to the Univerſity of *Altorf*, where, in the Year 1712, I cut a Lad of ſeven Years old, by the RAVIAN Method of Lithotomy, as I had juſt before explained it in my Chirurgical Lectures and Demonſtrations, and thereby extracted the Stone, in the Preſence of a great Number of Students in Phyſic; the Operation being afterwards repeated many Times by me at *Helmſtadt*, and elſewhere. From whence I think it appears, that I was

I was the firſt that performed this Method after RAW.

was the firſt, as far as I can hear, who performed this Method of Lithotomy, after RAVIUS, upon living Patients; which I had not only explained and demonſtrated in my Chirurgical Lectures from the Year 1708, by performing the ſame frequently on dead Subjects; but I alſo gave the following ſhort Deſcription of the Operation in the firſt Edition of my Surgery, printed in the *German* Tongue at *Norimberg* in the Year 1718, in §. XI. of the Chapter on Frere JAQUE's Method of Lithotomy. In that Place, after ſhewing that the Method, as JAMES originally performed it, was very unſucceſsful and deſpicable; I obſerve, that there were ſeveral judicious Surgeons and Phyſicians, who thought it might be more uſeful than the common Method in ſeveral reſpects, when executed by expert and knowing Hands, ſuch as were ſkilled in the Anatomy of the Parts, and knew how to amend the Defects of the Operation, as it then ſtood; for, as it was, none of them would undertake to perform it on living Patients; I there conclude, by obſerving, that, in my Opinion, RAW ſeems to have been the Corrector of this Method; for he, as I have ſeen, uſed to follow the Method of JAMES, as to the Place of his Inciſion; but he exchanged the Inſtruments, and uſed a grooved Catheter to cut upon, afterwards introducing a male and female Conductor into the Bladder, in the ſame manner as for the *Apparatus major*; by which means the Operation happily ſucceeded with him. And, ſoon after, comparing this Method with the *Apparatus major* in §. XII. I obſerve that in JAMES's Method, as improved by RAW, it is difficult to make the Wound ſo deep as to cut into the Groove of the Catheter in the Bladder, without injuring the adjacent Parts, which would not be ſo much endangered in the *Apparatus major*; which Obſervation I find to have been ſince publiſhed by others, without mentioning my Name. And this was the brief Intimation which I thought ſufficient at that Time to inform the Skilful, who might be deſirous of trying and improving the Method which lay then in Silence and untouched by any body but myſelf. But as the Operation has been ſince ſo much eſteemed and practiſed, and the Subject of many Diſſertations, I have therefore now been much more particular in relating every thing concerning RAW, and his Method, to compleat the Hiſtory of his Operation, more eſpecially with regard to what has eſcaped others, and fallen under my own Cogniſance.

Other Obſervations relating to RAW.

XV. Beſides the Obſervations which I have communicated at §. XIII. foregoing, relating to his Inſtruments, *&c.* it may alſo not be amiſs in this Place, to take notice of a few Particulars relating to the Life of this great Lithotomiſt; and, firſt, M. GARENGEOT aſſerts, that RAW obtained his Doctor's Degree through the Procurement of the Senate at *Amſterdam*, in Conſideration of his great Skill and Merit in Surgery and Anatomy, in which he firſt engaged himſelf in that City: But M. GARENGEOT appears to be in an Error with regard to this; for our Lithotomiſt had taken his Degree long before he performed any Operation at *Amſterdam*, even before his Name or Perſon were at all known in that City; for he obtained his Doctor's Degree in the uſual manner at *Leyden*, after he had travelled from *France* thro' *Holland* to *Leyden* in the Year 1694; after this, as ALBINUS obſerves, in the Life of our Lithotomiſt, he was haraſſed with an itinerant Life till he fixed his Seat at *Amſterdam*, where he firſt began to teach Phyſic and Anatomy to others, and particularly Surgery; which he practiſed with great Induſtry: It is not therefore true, that he had his Degree

Degree in the Method aſſigned by GARENGEOT, nor is it true, that he, by the ſame Means, acquired the Profeſſorſhip of Anatomy in the ſame City; for the Chair had been filled by RUYSCH above thirty Years before RAW was ſo much as known in *Amſterdam*. It is alſo well known, that RUYSCH executed that Office all the Time with great Aſſiduity and Applauſe, even till his own Death, which was a long Time after that of RAW; nor is it probable that a Man ſo well qualified and deſerving as RUYSCH, ſhould be diſplaced from his Profeſſorſhip, without any manifeſt Cauſe, in order to reſtore a Stranger, whoſe Abilities were much inferior: I may therefore juſtly affirm, that RAW had not ſo much as the ſecond Place to the Profeſſorſhip of Anatomy at *Amſterdam*; but all that he taught was in private to Pupils at his own Houſe, among whom I entered myſelf as one. It is alſo a juſt Obſervation of ALBINUS, that RAW applied himſelf more to the Practice of Surgery than Phyſic at *Amſterdam*; for I am certain, that he did not much care to be concerned in the Treatment of internal Diſorders; and, to ſpeak the Truth, he was not ſufficiently qualified for that Buſineſs. Sometime after the Departure of JAMES from *Amſterdam*, in his Tour for *Paris*, RAW made a cloſer Application to Lithotomy than he had ever done before, and, ſucceeding in an extraordinary manner, he was at length honoured with the Title of the *States Lithotomiſt*; however, we muſt not forget to mention, that, in his Courſe of Operations, which he demonſtrated to young Students, when he came to the Subject of *Lithotomy*, his Phraſe was: "That he had nothing to ſay upon that Head, becauſe it was the Means by "which he ſubſiſted, and got his Living; and I had rather be ſilent, than pro-"poſe any thing which might miſlead you from the Truth; but, ſays he, if "you can learn it by ſeeing me perform the Operation upon living Subjects, "you are welcome, and for the reſt you may read CELSUS." This indeed was a Token of his Avarice, and ſeemed to me a kind of Myſtery for a long Time, till at length I concluded that he cut upon the Catheter in that Part of the *Perinæum*, which had been pointed out by CELSUS to be inciſed, either upon the Stone or a Catheter. I remember that, while I was engaged with him, he had a Deſign to publiſh a Diſſertation upon ſome Subjects, which had been neglected by other Surgeons chiefly in the Eye and Ear; (for I believe he wanted either Application or Ability to engage in any larger Subject,) in which he particularly deſcribes a Proceſs of the *Malleus*, called from him the *Proceſſus Ravianus*, which, he has declared to me and others, was accurately expreſſed in Copper-plates then in his own Cuſtody; but I do not underſtand that he ever publiſhed this Treatiſe, nor any other, except the Oration at his Inſtalment into the Profeſſorſhip of Anatomy and Surgery at *Leyden*, after the Death of BIDLOW. Laſtly, I muſt not omit that M. DENYS, Surgeon and Lithotomiſt at *Leyden*, writes in the Preface and Introduction of his Treatiſe upon cutting for the Stone, that he had taken upon him to make the ſame publick to the World, that it might receive the Benefit of the Obſervations, which had occurred to him in the Practice of Lithotomy, as it had been performed by RAW, to whom he was an Aſſiſtant; notwithſtanding which, as I have once before obſerved, he does not ſpeak a Word of the true Manner in which RAW uſed to cut his Patients, and, as M. DENYS tells us, it was revealed to him juſt before the Death of his Maſter; but the whole Drift of his Diſcourſe ſeems only to prove, that this Me-

thod of Lithotomy was better than the reſt, that RAW was the Inventor of it, and that he himſelf continued to exerciſe it with Succeſs.

CHESELDEN's, or rather BAMBERY's Improvement.

XVI. The celebrated *Engliſh* Surgeon Mr. CHESELDEN endeavoured to improve RAW's Lithotomy, by varying the Practice, and adding more convenient Inſtruments; but the very firſt to whom RAW's Method of Lithotomy owes any Improvement in *England*, was BAMBERY, who performed the Operation in the publick Hoſpital at *London*, as we are informed by DOUGLAS, in his Hiſtory of the *Lateral Operation*, who there tells us, that he followed RAW's Method in every reſpect, except that he uſed previouſly to diſtend the Bladder with Water before the Operation, by which Means he cut and freed ſeveral Patients from the Stone, with Succeſs equal to that of RAW; but it gives me no ſmall Concern that DOUGLAS ſhould not have informed us in what manner the Water is to be conveyed into the Bladder, and retained there after the Extraction of the common Catheter and Introduction of the grooved Catheter, between which it is probable all the Water would in the interim be diſcharged, upon which account this Method of diſtending the Bladder with Water, ſeems to be of little or no Service; but Mr. CHESELDEN has in ſome meaſure changed RAW's Method of Lithotomy, and performs it in the following manner:

Mr. CHESELDEN's Method of Operating.

XVII. His Table, which is of a ſquare Figure for holding the Patient, is higher at that End upon which the Patient is to be ſeated than at the other; the Length of the Table is about three Feet and an half, its Breadth about two and an half, and its Height from the Ground three Feet. The Patient being laid on his Back upon this Table, has a Pillow placed under his Head, and another under his Hips, ſo that his Abdomen lies lower than his Head and Hips; his Buttocks are then drawn a little beyond the Edge of the Table, the Knees are then drawn from each other, and bent in a convenient Poſture; and, laſtly, the two Wriſts are tied to each of the Ancles; in this Poſture the Patient is held by three Aſſiſtants, two which ſecure the Legs and Feet, and the third holds down the Patient's two Shoulders ſo firmly, that he cannot move his Body, or withdraw it from the Hand of the Operator; M. CHESELDEN then paſſes a Steel grooved and cannulated Catheter [a] thro'the Urethra into the Bladder after the uſual manner, and thereby injects a ſufficient Quantity of Water to diſtend the Bladder moderately, without giving the Patient any great Uneaſineſs [b], much in the ſame manner as in the high Operation; but to prevent the Water from returning again out of the Bladder, he makes a Ligature of Flannel upon the Penis, ſo as to compreſs it, the Catheter ſtill remaining in the Bladder [c]: After this he gives the Handle of the Catheter to be held by a prudent

[a] It is to be wiſhed that Mr. CHESELDEN had delineated this Catheter, ſince it is not eaſy to conceive, by his ſhort Deſcription, how the Catheter could be both grooved and cannulated at the ſame time.

[b] Which Quantity, he ſays, muſt be always judged of by the Patient's Pain or Uneaſineſs which it occaſions, ſince the Variety of Bladders will not admit of the certain Quantity to be determined; but, as an Example, he tells us, that ſeven Ounces was the Quantity of Water injected into a young Man of eighteen Years old, who had a Stone weighing ſix Ounces.

[c] But we are not told by DOUGLAS in what manner Mr. CHESELDEN prevented the Water from eſcaping out of the Bladder thro' the Catheter: The Ligature will indeed prevent it from paſſing betwixt the Catheter and Urethra, but will not hinder it from coming through the Cavity of the Catheter; which therefore muſt be cloſed by another Ligature, the Finger, or ſome other Means.

Aſſiſt-

Aſſiſtant, not to preſs its Groove towards the Part to be inciſed, as is uſual in the high Operation, and in RAW's Method, but only to take care that it does not ſlip out of the Bladder from the Cauſes we ſhall preſently mention. This done, Mr. CHESELDEN places himſelf in a Chair, correſponding to the Height of the Table and Patient, ſo that he may perform the Operation ſitting; in the next Place he makes an Inciſion with a round-edged Scalpel, beginning about an Inch above the Anus on the left Side of the Perinæum betwixt the Accelerator-muſcle of the Urethra and the Erector-penis in the manner of JAMES and RAW, and deſcending obliquely downwards towards the Out-ſide of the Sphincter-muſcle of the Anus, divides about the Space of two or three Fingers-Breadth, more or leſs according to the Patient's Age or Size, and this Inciſion he makes at once thro' the whole Skin, Fat, and Part of the Levator-muſcle of the Anus, contrary to RAW, who divided the Parts by ſeveral Inciſions; when he has done this, he introduces the Fore-finger of his left Hand into the Wound, and thereby preſſes the Rectum to the other Side, that it may not be injured by the Knife, then he takes another Scalpel of a falciform, or a crooked Figure in his right Hand, and paſſes the Point thereof by the Side of his left Fore-finger ſtill remaining in the Wound, 'till it has pierced the Bladder between the *Os Iſchium* and ſeminal Veſicle, then turning the Point of the Knife upwards, he continues to enlarge the Inciſion therewith, 'till it again comes out at the upper Part of the Wound where it entered. The Bladder being thus opened [d], he paſſes the Fore-finger of his Left-hand into its Cavity, and thereby feeling the Stone, and holding it firm, he introduces a Pair of Forceps without any Conductor over his Finger, and therewith endeavours to lay hold of the Stone, which, when done, he withdraws his Finger, and graſping the Forceps with both his Hands, he endeavours to extract it with more or leſs Force, in proportion to the Size and Figure of the Stone, and width of the Wound. If there ſhould be more Stones than one, he again introduces his Fore-finger, and then the Forceps into the Bladder, and proceeds to extract them as before; during the whole Operation he always leaves the Catheter in the Urethra and Bladder, and the Aſſiſtant who holds it, does nothing more than prevent it from moving in, or falling out of the Urethra, and in this manner Mr. CHESELDEN thinks the Bladder may be ſufficiently divided for introducing the Forceps over his Finger without any Conductor; and as the Bladder is before filled with Water, it is neither neceſſary nor poſſible to cut through it into the Groove of the Catheter, nor is there any Danger of laying hold of the Catheter with the Forceps, if the Stone be in this manner directed to it by the Fore-finger. In this Method only one or two ſmall Arteries are divided, ſo that there is no great Danger of any Hæmorrhage enſuing, which ſeldom happens; but if, after the Wound has been cleanſed with a wet Spunge, the Blood ſhould continue to flow, thoſe ſmall Arteries which are divided, are then to be taken up with a crooked Needle and Thread, as repreſented in *Tab.* XXXI. *Fig.* 14. And the Wound being dreſſed with dry Lint, ſpread with ſome digeſtive Ointment, and ſecured with proper Compreſſes and Bandages, the Patient may then be put to Bed; and in this manner, if no extraordinary Impediment occurs, Mr. CHESELDEN performs the whole Operation in the ſpace of one

[d] I imagine he muſt alſo divide the Neck of the Bladder, tho' he does not mention it.

Minute, computing from the firſt Entrance of the Knife till after the Stone is extracted, as DOUGLAS informs us.

Some Accidents and Cautions.

XVIII. In the mean time it is to be obſerved, that Mr. CHESELDEN is ſometimes obliged to vary his Method of operating according to particular Circumſtances, as when, 1. He ſhould have taken hold of the Stone, and in endeavouring to extract it, perceives, from its great Reſiſtance and other Signs, that it is a very large one, rather than put the Patient to extreme Torture, by forcing it thro' and lacerating the Wound, he chuſes to enlarge it by making a ſecond Inciſion, either with a Scalpel or Sciſſars. 2. After the Inciſion is made, if he perceives the Catheter to be ſlipt into the Wound, as he paſſes his Finger thro' it into the Bladder, he withdraws his Finger, and paſſes a Conductor, or the Gorgeret in its ſtead, into the Groove of the Catheter, over which he again paſſes the Forceps in the uſual manner into the Bladder; and upon this Account, as the Accident may frequently happen, he generally prefers the grooved Catheter before the common one. 3. If the Aſſiſtant who holds the Catheter, ſhould perceive that it is taken hold of by the Forceps, either with or without the Stone, which is an Accident that Mr. CHESELDEN affirms not to be often met with, in that Caſe he orders the Catheter to be drawn out, and then tries to lay hold of, and extract the Stone, without that Advantage which the Catheter might otherwiſe afford, by preſſing down the Bladder, for the more eaſy Admiſſion of the Forceps over the Finger to the Stone in the Bladder. 4. When by reaſon of the Smallneſs, or Situation of the Stone, he thinks it may be more convenient to preſs it thro' that Wound, as in the *Apparatus minor*, he then does it by introducing his Fingers into the Patient's Anus, without making uſe of any Forceps. 5. When he perceives any Reſiſtance to the Stone in its Extraction; or if there is any Conſtriction of the Parts occaſioned either by the Ureter, or membranous Folds of the Bladder intercepting it, he then alſo introduces his Fingers into the Patient's Anus, and thereby endeavours to thruſt the Stone to the Mouth of the Wound, where he divides the Membranes, or whatever elſe might obſtruct its Exit; and thus the Stone being ſet at Liberty is eaſily extracted. From hence, ſays DOUGLAS, one may eaſily perceive, what Alteration and Correction has been made in RAW's Method of Lithotomy by the acute Mr. CHESELDEN, and which ought to be the more regarded, as thereby he has happily cut and cured many, that have been violently afflicted with the Stone, inſomuch that DOUGLAS tells us, that in the Time he then writ, there was not one Patient, who miſcarried under his Hands. However, he adviſes one thing more, which he thinks neceſſary towards compleating the Operation, and that is, to have the Forceps made a little crooked, which in ſome Caſes has been uſed by Mr. CHESELDEN to much more Advantage than the ſtraight ones; he ſays he has frequently obſerved, that the Stone may be extracted with much more Eaſe when it lies near the Wound, than in the oppoſite Side of the Bladder, eſpecially if there ſhould be ſome preternatural Sinus in that Part, as it ſometimes happens, in which Caſe the Stone may be more eaſily intercepted, and extracted by a Pair of crooked, than ſtraight Forceps.

Another Method of Mr. CHESELDEN's.

XIX. But however commodious, eaſy, and ſafe this Method of Lithotomy might at firſt appear to DOUGLAS and CHESELDEN, we find that it was rejected ſoon after by the laſt, becauſe it frequently occaſioned, as he ſays, a fetid Ulcer

Ulcer in the *Cellular Membrane*, near the Rectum, by the Inſinuation of the Urine; he therefore contrived and approved of the following Method, as firſt, he tied the Patient as uſual, for the *Apparatus major*, but laid him upon an even Table covered with ſeveral Clothes, and about three Feet from the Ground only elevating his Head a little higher than the reſt of his Body; after this he makes as large an Inciſion as the Parts will admit of, beginning in that Part of the Perinæum where the Inciſion of the *Apparatus major* uſually ends, continuing the ſame downward between the Accelerator-muſcle of the Urethra, and the Erector-penis on the left Side of the Inteſtinum rectum; he then ſearches for the Catheter in the Wound, and having found it, cuts through the proſtate Gland ſtraight forward into the Bladder, at the ſame Time preſſing the Rectum to one Side with the Finger of his left Hand, to prevent it from being injured by the Knife, and continues to go thro' the remainder of the ſame Operation, in the ſame manner as for the *Apparatus major*, only if he has divided any large Blood-veſſels, they are afterwards taken up with a Needle and Thread.

Explained more at large by DOUGLAS.

XX. What has been briefly declared by Mr. CHESELDEN concerning this Method of operating, is exemplified more at large by DOUGLAS, in an *Engliſh* Treatiſe, entitled *An Appendix to the Hiſtory of the lateral Operation*, 4to, in the Year 1731. In the firſt Place he proceeds as in the *Apparatus major* and lateral Operation; that is, he places the Patient upon the Table, and ſecures him in a proper Poſture with Ligatures, as we mentioned before §. XVI. after which he paſſes his Catheter (repreſented in *Tab.* XXXI. *Fig.* 5.) in the uſual manner into the Bladder of the Patient; but as ſoon as the Inciſion is made in the external Parts, as we before mentioned, he directs the Point of his Scalpel towards the Catheter, which differing from the common, is repreſented in *Tab.* XXXI. *Fig.* 8. with the Point of this he makes his Inciſion ſucceſſively thro' the poſterior Part or Bulb of the Urethra, through the Neck of the Bladder and proſtate Gland, and Part of the Bladder itſelf, cutting through them in a right Line into the Groove of the concave Part in the Catheter, *Fig.* 4 and 7. See *Tab.* XXIX. *Fig.* I K L. Having thus made his Inciſion ſufficiently large, he riſes from his Chair, and paſſing the Fore-finger of his Left-hand into the Wound, gently dilates it for the Paſſage of a particular kind of Conductor, reſembling the Gorgeret *Tab.* XXXI. *Fig.* 9. but with a crooked Handle marked A A, the Point of this Inſtrument he paſſes into the Groove of the Catheter, that it may be held more ſecurely in its Situation, and, having felt the Stone, he takes the crooked Handle of the Conductor in his left Hand, and, having drawn out the Catheter, introduces his Forceps, *Fig.* 11. whoſe Structure at the Hinges is a little different from the common; theſe he paſſes with the ſmooth Side upward thro' the Groove of the Conductor into the Bladder; then he draws out the Conductor, and feeling the Stone with the End of the Forceps as yet ſhut, he then opens them ſo as to intercept the Stone, and applying both his Hands to the Inſtrument, his left Hand to the middle, and his right to the Extremity of its Handle, endeavours to extract the Stone gradually, that the Parts may dilate and give way; to promote which he gently turns round the Forceps, and moves it in all Directions, taking care at the ſame Time that the Stone does not ſlip out. If the Stone is large and ſmooth, being lodged in the Cavity of the Bladder oppoſite to the Wound, he extracts it with great Eaſe from all Patients

tients of whatever Age; but if he finds the Stone to be very ſmall, or inconveniently ſituated, ſo that it cannot be intercepted by the Forceps, he extracts that Inſtrument, and introduces his Finger into the Bladder, in order to turn the Stone, and free it from the Wrinkles of the Bladder; he then paſſes his Conductor over his Finger, which he then withdraws, and turns the concave Part of the Conductor upward thro' which he at laſt conveys his Forceps to intercept and extract the Stone as before, but very ſlowly and cautiouſly. Laſtly, to prevent the Stone from breaking in its Extraction, he thruſts one or two of his Fingers betwixt the Cheeks of the Forceps, that they may not pinch the Stone too violently; but if it ſhould break notwithſtanding this Precaution, or if there are more Stones than one, he repeats the Operation of paſſing the Forceps with his Finger to intercept and extract each of them, which when cautiouſly performed, he aſſures us, is not attended with any Danger. He makes his external Inciſion in the ſame Part with JAMES and RAW; but he continues it much higher and lower, that his Inſtruments may meet with the more eaſy Paſſage into the Bladder, and the Stone by that Means be more readily extracted; but internally when he has divided Part of the Urethra, the Neck of the Bladder, and Part of its Body, if the Stone be large he continues the Inciſion, without injuring the Rectum, which is very liable to be wounded in the lateral Operation, and thus he commodiouſly extracts Stones of a very large Size. If any ſmall Artery is divided, and bleeds exceſſively, he takes it up with a ſmall crooked Needle and Thread when it lies ſuperficially, but when it is deeply ſituated, ſo that he cannot come at it with a Needle, he endeavours to ſtop the Blood with a ſtyptic Liquor. Having extracted the Stone, he then dreſſes the Wound with a digeſtive Ointment ſpread on Lint, and retained with a ſlight Bandage; then the Patient is conveyed to Bed, and the Lips of the Wound are brought together gradually by tightning the Bandage at each Dreſſing, which after the firſt Time is uſually twice a Day. From hence, ſays DOUGLAS, it appears that this Method of CHESELDEN is compoſed partly of the *Apparatus major*, and in Part of RAW's Method of Lithotomy; but in my Opinion it ſeems altogether to be RAW's.

Mr. CHESELDEN's third Method.

XXI. We are farther to obſerve, that the ingenious and diligent Mr. CHESELDEN did not here ſtop ſhort in his Reſearches and Experiments, but has endeavoured to make ſtill farther Improvements in his Method of Lithotomy, chiefly with regard to his Inciſion internally, which he performs by directing the End of his Knife thro' the inferior and lateral Part of the Bladder above the ſeminal Veſicle, and behind the proſtate Gland, till it had reached into the poſterior Part of the Groove in the Catheter. See *Tab.* XXIX. *Fig.* 5. L. He then continued his Inciſion forwards thro' the Sphincter of the Bladder and left Side of the Proſtate, into and through the membranous Part of the Urethra, till he arrived at its Bulb, repreſented by K I F much in the ſame manner as is deſcribed in his firſt Method at §. XVII. for by that Means he was ſurer to avoid injuring the Rectum, than in RAW's, and the preceding Methods; he alſo aſſerts, that, in the preceding Methods of cutting, the Groove of the Catheter cannot be ſo eaſily perceived and cut into thro' the Bulb of the Urethra, which DOUGLAS, in his forementioned *Appendix*, has declared more at large. M. MORAND propoſes nothing concerning this Method, but declares that deſcribed at §. XIX. to be the beſt. Laſtly, among Mr. CHESELDEN's

den's Emendations in Lithotomy, the following are alſo numbered by Douglas. 1. That when he finds the Patient's Pulſe to be very low after the Operation, he applies Bliſters to his Arms, to raiſe his Spirits, which anſwers to good purpoſe. 2. When he perceives the Wound to grow callous, he introduces a bit of Bliſter-plaſter, which erodes it, ſo that new and ſound Fleſh may afterwards ſprout up, and cloſe the Wound. 3. If the Wound is foul or putrid, he mixes a little Verdegreaſe with a digeſtive Ointment.

De Dran's Opinion and Obſervations.

XXII. The celebrated M. Le Dran of *Paris* has a *French* Treatiſe, intitled, *Parallele de differentes manieres de tirer la Pierre hors de la Veſſie*, printed in 1730, in which he endeavours to deliver all the Methods of Lithotomy, which have been to this Day at any Time practiſed, and after making an accurate Examination into them, not only illuſtrates them with many Experiments upon dead Subjects; but alſo with great Induſtry remarks the Structure of the Parts to be divided, with the Advantage and Diſadvantage to which each Method is liable; from whence he concludes, that one Method is only preferable to the other, according to the particular Circumſtances of the Caſe, and therefore he adviſes every prudent Surgeon, who intends to cut for the Stone, to make himſelf well acquainted both with the Theory and Practice of all the Methods of Lithotomy, which may in any Caſe be practicable. In the mean time he eſteems the Method of cutting by the *Apparatus major* to be preferable, on ſeveral Accounts, to the reſt, if it be performed with Diſcretion, and particularly having a regard to what has been ſaid in § VII. and VIII. upon the *Apparatus major* from the ſame Author, and chiefly to obſerve, that the Neck of the Bladder be ſufficiently divided, and afterwards dilated gently with the Fore-finger and a Conductor; for when that is done precipitately, as is the Practice of ſome, it occaſions a grievous Laceration of the Part, violent Pain, and other bad Symptoms, which might be avoided by uſing the Finger in this Manner; and therefore he juſtly reprehends thoſe Surgeons, who, out of a vain Deſire of being thought more dextrous than the reſt of their Brethren, endeavour to introduce the Forceps, and extract the Stone with uncommon Haſte and great Violence, the Conſequence of which may be Laceration, violent Inflammation, a Gangrene, and perhaps Convulſions, and Death itſelf.

His Opinion on the other Methods.

XXIII. But the forementioned Author does not detract from the Merit of the *Apparatus altus*, nor of the lateral Operation; but he endeavours chiefly to ſhew, that the Neck of the Bladder and proſtate Gland ought to be divided by the Knife in the lateral Operation, as they are gently dilated by the Finger in the *Apparatus major*. He thinks that the high Operation may be ſafely performed in ſuch Caſes where the Bladder is large, and may be ſufficiently dilated, by diſtending it with Liquor, which he thinks may be reaſonably conjectured, from the Patient's being able to contain a large Quantity of Urine in his Bladder, he not having been ſubject to the Stone for any conſiderable Time; but he judges this to be a pernicious Method for thoſe, whoſe Bladders are ſmall or callous, that it cannot be ſufficiently diſtended, which is generally the Caſe with thoſe, who have been a long Time ſubject to the Stone, and thereby compelled frequently to diſcharge their Urine. He thinks the lateral Operation of Raw and Cheselden preferable to the common Method, when the Stone is very large, as it then requires an Inciſion in the Body of the Bladder, which may be enlarged and dilated at Diſcretion, in proportion to its Size.

However, he objects to the Catheter of RAW, which is delineated by ALBINUS, though, to ſay the Truth, the Catheter of LE DRAN himſelf is much ſhorter than that of ALBINUS, which, he ſays, is unfit for dividing the Bladder, ſince it too eaſily and frequently ſlips out of it, and therefore he preſents the Reader with the Figure of another Catheter, which he judges to be more ſuitable for this purpoſe. See *Tab.* XXXI. *Fig.* 17. which is perforated for ſome Space with a long Aperture markd *e. e.* by means of which the Neck of the Bladder may be compendiouſly inciſed, and an Opening made ſufficient for the Admiſſion of the Gorgeret, and Extraction of the Stone. Beſides this, the Figure of his Knife is repreſented to us, differing from the common, chiefly at its Point, *Fig.* 16. which he thinks may be alſo advantageouſly uſed to cut for the Stone, according to the Method both of RAW and CHESELDEN.

His Opinion of the Apparatus Minor.

XXIV. But ſuch a bad Opinion has M. LE DRAN of the *Apparatus minor*, that he thinks it ought not to be ranked among the other Methods, but rejected as pernicious, except it be for removing the Stone in the Urethra, or extracting it from the Neck of the Bladder; however if we conſider that the Wound in this Method is made in the ſame Parts, as in the lateral Operation through the Neck and Body of the Bladder, and that thoſe two Methods differ only with regard to the Inſtruments, in the Opinion of myſelf and others[e]; it will from thence follow, that the *Apparatus minor* is an Improvement of the old Method, and is therefore not without its Advantages. 2. That it has been the only Method in Practice for theſe XVI. Centuries paſt, and has been not only exerciſed with Succeſs during that ſpace, but was in the laſt Century, and is at this Day ſuccesfully uſed in ſeveral Parts of *Europe*[f]; notwithſtanding the *Apparatus major* is ſufficiently known in all Parts. 3. Experience teſtifies, that it is now daily performed with the deſired Succeſs, eſpecially upon Children and Infants, not only by itinerant Practitioners, but alſo by MARINUS[g], myſelf, and many expert Surgeons among the *Italians*. 4. Even in young Men and Boys under fourteen Years of Age, alſo in Adults, and Men of ſmall Stature this Method of operating may be very well performed[h], as we are ſenſible of no material Objection, except the Stone ſhould have a rough Surface. 5. Another Recommendation is, that it is practicable with the feweſt Inſtruments, even with nothing more than the Knife; and Simplicity in chirurgical Operations is always a great Recommendation in their Behalf for Practice. We therefore think, that the *Apparatus minor* ought rather to be retained, and farther improved; and I would ſtrenuouſly adviſe, with ÆGINETA and ALBUCASIS, that the Inciſion be made thro' the ſame Parts as in the lateral Operation. In

[e] Particularly M. WINSLOW, MORAND, FALCONET, *&c.*

[f] There have frequently been *Engliſh* Surgeons and Phyſicians in *Germany*, who have talked of *the Operation on the Gripe*, or *cutting on the Gripe*, as a very common Practice: And DOUGLAS, in his Lithotomy, tells us, that he continues to cut ſmall-ſized Men by that Method; and the *Italians* ſtill continue the ſame Practice. In *France* this Method was in the laſt Century performed with Succeſs at *Paris*, and elſewhere by the famous RAOUX. The *Apparatus minor* was alſo countenanced by TOLET in the laſt Century, and SAVIARD, a very late Writer in Surgery at *Paris*, tells us in his *Obſ.* 86. that he performed this Method on a Girl. To theſe we may add M. DIONIS in his Surgery, *pag.* 182. And MORAND, *in Mem. Acad. Reg. Pariſ.* 1731.

[g] See his *Italian* Treatiſe concerning the more principal and difficult Operations in Surgery.

[h] M. MORAND *in Mem. Acad.* now cited, aſſerts the Method be be practicable in all Adults without Diſtinction.

Adults,

Adults, and thoſe who are advanced in Years, it muſt indeed be confeſſed, that this Operation is not ſo ſuitable, and therefore CELSUS adviſes it only to Children and Lads under fourteen Years, excluding thoſe from it, who are adult, though even in thoſe it may be ſometimes performed with Succeſs, when the ſeveral Circumſtances are duly conſidered, as M. MORAND alledges in *Mem. Acad. Reg.* 1731.

GARENGEOT on the lateral Method of cutting.

XXV. M. GARENGEOT, in the firſt Edition of his Chirurgical Operations, has not ſaid a Word concerning the high Operation, nor of the lateral Method of cutting for the Stone, as if he knew not that there was any ſuch thing in Being, or in Print; he has, however, in the ſecond Edition of the ſame Book, inſerted the lateral Method of Lithotomy, and extolled it above all others, ſince he finds it has been the Subject of ſo many Diſſertations both in *England* and *Germany*; tho' he never once made trial of the Operation himſelf upon a living Subject; but, after his uſual manner, he does not fail to attribute the Honour both of the Invention and Improvement of this Method to his own Country only. When at the ſame Time the Method had been treated of, before the firſt Edition of his Book, by a great Number of Authors, as ALBINUS, DOUGLAS, CHESELDEN, BUSSIERE, LISTER, LAUNAY, SAVIARD, ERNDEL, FEHRIUS, and myſelf. But I hope it is ſufficiently apparent, that both the *German* and the *Engliſh* Surgeons deſerve to be allowed a Share in this Advancement of Lithotomy; for tho' MERY and MARESCHALL were the firſt (according to Dr. LISTER's Account) who hinted at improving JAMES's Method of Lithotomy; yet we find that both they and the reſt of the *French* Surgeons deſerted the Method ſoon after, and rejected it as both uſeleſs and pernicious. But the Honour of reſtoring this Method to Practice, after it had been rejected by the *French*, is due to RAW, who is the firſt that attempted to reform and practiſe it on living Subjects, and perſiſted in the ſame Method with Improvements, as long as he lived. Next to RAW, myſelf was the firſt Perſon, and then M. DENYS, who pactiſed it in *Holland*, till at length it was received and improved by the *Engliſh* Surgeons, who have ſhewn a great deal of Merit herein: So that, if it had not been for others, the Operation would probably have lain for ever neglected and forgot among the *French*; and M. GARENGEOT himſelf would have been perpetually ignorant of it. The Method being thus improved and practiſed with Succeſs in the Hands of others, while it had lain neglected by the *French* for the ſpace of thirty Years, till afterwards many Diſſertations publiſhed on the Subject had made it very remarkable and famous in the learned World; at length the *French* began alſo to embrace it, in order to which M. MORAND put on a laudable Condeſcenſion to travel into *England* in the Year 1729, to ſee, and be preſent with Mr. CHESELDEN in his Operations, contrary to GARENGEOT, and others of the *French* Surgeons, who were perſuaded, that there was nothing to be learned out of *France*[a]. When M. MORAND had learned what he could of Mr. CHESELDEN, he then returned to *Paris*[b], where he performed the Operation with Suc-

[a] The ſame proud Opinion ſeems to be alſo entertained by the Author of the Preface to COLOT's Lithotomy, *pag.* 80. & ſeq.

[b] See Memor. Acad. Reg. *Paris* 1731. and GARENGEOT's Chirurgical Operations, Chap. *on the lateral Operation.*

ceſs upon ſeveral Patients, as we ſhall preſently relate more at large. During M. MORAND's Abſence, ſeveral of the *French* Surgeons, and particularly M. GARENGEOT, and PERCHETUS, Surgeon to the Hoſpital *La Charité*, made trial of the Operation upon dead Subjects, according to the Direction of ALBINUS and CHESELDEN, and when PERCHETUS had by this means rendered himſelf ſufficiently perfect, he performed the ſame with Succeſs upon a Lad, and was the firſt, according to GARENGEOT [c], who happily performed this Method after JAMES at *Paris*, where he performed his Operation in the following manner:

GARENGEOT on the lateral Method of cutting.

XXVI. The Patient being prepared, and the Day appointed for the Operation, the Surgeon ſhould firſt order a Clyſter to be adminiſtred, before he proceeds to his Work; after which the Patient is to be ſecured with Ligatures, as in the *Apparatus major*, and placed upon a Table about two Feet from the Ground oppoſite to a good Light; a Pillow is then to be placed under his Hips, and another under his Head. The Patient being tied, his two Legs are to be held faſt by two Aſſiſtants, and a third Perſon is to hold down his Shoulders, in ſuch a manner that he cannot ſtir himſelf any way, which is highly neceſſary for the ſafe Performance of this Operation. In the next Place a diſcreet Perſon is to be placed on the left Side of the Patient, in order to hold up the Scrotum, extend the Skin, and retain the grooved Catheter in the right Poſition in which it was placed in the Bladder by the Surgeon, and this is done in Imitation of Mr. CHESELDEN, that the Lithotomiſt, having both his Hands at Liberty, may more commodiouſly go thro' his Operation. Then a Steel Catheter made very crooked with a deep Groove, and long Beak, and a broad Handle, being firſt dipt in Oil, is then paſt thro' the Urethra into the Patient's Bladder, in which being enter'd, the Lithotomiſt gently inclines its Handle with his left Hand towards the right Inguen of the Patient, and at the ſame time ſearches between he Suture of the Perinæum, and Tubercle of the Iſchium with his right Fore-finger, in order to feel the Beak of the Catheter through the Integuments, and to prevent it from touching the Iſchium: The Handle of the Catheter thus diſpoſed, is then held by an Aſſiſtant in his right Hand, in ſuch a manner, that his Thumb lies upon the upper Part of the Handle, and his Fingers below, taking care that it does not by any means ſtir or move out of its Place, while, with his left Hand, he elevates the Scrotum, and inclines it towards the right Side, in order to extend the Skin of the Perinæum; then the Lithotomiſt, applying his left Fore-finger to the Suture of the Perinæum, preſſes it obliquely towards the right Thigh, and holding the Knife in his right Hand, firſt divides obliquely thro' the Skin and Fat, beginning about an Inch on one Side of the Suture of the Perinæum, and about a Line above the moſt prominent Part of the Beak of the Catheter, and extending it obliquely [d] down

[c] In his Surgery, Chap. *on the lateral Operation*.

[d] There are indeed ſome who endeavour to give out, that RAW performed his external Inciſion in a right Line; from whence they infer, that he did not cut obliquely, but committed many Errors. But I have myſelf often ſeen him cut in an oblique Direction, as ÆGINETA had long before deſcribed in *Lib. VI. cap.* 60. tho' that oblique Inciſion is in itſelf ſtraight, and not lunar, as CELSUS directs. But then the Inciſion was oblique with regard to the Parts, as ALBINUS rightly obſerves, and made from above downwards, or towards the Tubercle of the Iſchium to avoid the Rectum; but then this is obliquely; for a right Line may be, comparatively either direct and parallel, tranſverſe or oblique.

to the Tubercle of the Iſchium in the manner of RAW, who made his Inciſion from above downwards, tho' JAMES made his Inciſion from below upwards. With regard to the Depth of the Inciſion it is to be obſerved, that in lean Patients it may be done at once; but in thoſe who are fat and more robuſt, it may require two or three Strokes with the Knife, more or leſs according to the Judgment and Dexterity of the Surgeon. This done, the Lithotomiſt then paſſes his left Fore-finger thro' the Wound, not to preſs the Rectum on one Side, to prevent it from being injured in the manner of Mr. CHESELDEN, but to find and obſerve the Groove of the Catheter; that if it be diſplaced, it may be again rightly diſpoſed, for the Rectum is in no Danger of being injured by the Knife, when the Inciſion is performed according to the preceeding Direction, nor is there any Difficulty of ſearching for the Groove of the Catheter; then to make the ſecond Inciſion the Lithotomiſt requires each of the Aſſiſtants to hold the Patient firm, while he paſſes the Knife firſt thro' the Urethra, directing its Point into the Groove of the Catheter, over the Nail of his left Fore-finger, then he proceeds to divide the Neck of the Bladder laterally; and, laſtly by elevating the Knife, ſo that the Back of its Point may be kept within the Groove of the Catheter, and its Edge towards the Body of the Bladder itſelf, which is then to be divided for about a Finger's Breadth or more, in which Procedure conſiſts the chief Advantage of this Method; but then the Fore-finger ſhould follow the Knife, as it divides the Parts, leſt it ſhould ſlip out of the Groove in the Catheter. The Inciſion being thus made ſufficiently large, ſo that the Groove of the Catheter is laid bare for about two Fingers Breadth, the Knife is then withdrawn, the Fore-finger ſtill remaining in the Groove of the Catheter, a Conductor is then conveyed by the right Hand of the Lithotomiſt by the Side of his left Fore-finger, by the Nail of which the Point of that Inſtrument is directed into the Groove of the Catheter. In the next Place, the Surgeon withdraws his left Fore-finger, and with the ſame Hand takes hold of the Handle of the Catheter, which had been till then held by the Aſſiſtant, and inclining it a little towards himſelf at the ſame Time, protrudes the Conductor, whoſe Point is in the Groove of the Catheter, into the Cavity of the Bladder, which may be judged to be rightly performed, when the Urine runs out both thro' the Inſtrument and the Wound. This done, the Surgeon then gently extracts the Catheter, by moving it a little from one Side to the other; then he takes the Handle of the Conductor into his left Hand, and paſſes his right Fore-finger thro' its Channel into the Bladder, thereby gently dilating the Wound, for the more eaſy Admiſſion of the Forceps, which are next conveyed with his right Hand thro' the Cavity of the Conductor into the Bladder, after which with his left Hand he extracts the Conductor, and ſtrongly opens the Forceps, to make a further Dilatation of the Wound, then ſhutting them again, he ſearches for the Stone, which being intercepted by the Forceps, is extracted by them, as we before directed. The Stone being extracted, the Fore-finger is then paſt into the Bladder, to ſearch if there be any other yet remaining, which, if ſo, the Forceps are again introduced over the Finger to the Stone, and its Extraction performed like the former. Thus you have the Directions for performing Lithotomy according to M. GARENGEOT, who has endeavoured to illuſtrate the ſame by Figures, which are however ſo badly adapted and expreſſed, that myſelf and many others are altogether ignorant

of their Meaning. Laſtly, we muſt not omit his great Admonition, agreeable to DOUGLAS, in Oppoſition to ALBINUS Junior, that the Bladder alone cannot be inciſed by this Method, without dividing at the ſame Time both its Neck and the proſtate Gland laterally, with a very ſmall Portion of the Bladder, as MORAND obſerves; there is alſo a ſmall Knife exhibited by him, for this purpoſe, which we have repreſented in *Tab.* XXX, *Fig.* 15, from Mr. CHESELDEN.

Lateral Operation of SENFFIUS.

XXVII. It will not be foreign to our purpoſe in this Place, to take notice of the ſeveral Improvements in the lateral Method of Lithotomy, which have come under my own Obſervation, either by reading or converſing with other Surgeons in *Germany*, which I ſhall therefore communicate for the publick Good; but in this Place I ſhall only propoſe what has been done in this Matter by SENFFIUS, Surgeon to the King at *Berlin*, at which Place he was alſo Surgeon to the ſplendid and Royal Hoſpital of Charity, alſo Profeſſor and expert Demonſtrator of chirurgical Operations, but is now, to the great Diſadvantage of Surgery, deceaſed; however, I ſhall here relate the manner in which he frequently performed the lateral Operation with Succeſs; and this I ſhall do from the Account given me by my own Son, who reſided a great Part of the Year 1735 and 1736 at *Berlin*, under the Tuition of that celebrated Profeſſor, whom he has ſeen perform that Operation with great Dexterity, both upon dead and living Subjects. This great Man, who was admirably well ſkilled in all the Operations of Surgery, as well as that of Lithotomy, judged that the Method of cutting by the lateral Operation was preferable to all others, with which we are at this Day acquainted, and uſed to perform the ſame in the following manner. Firſt, the Patient was placed upon a Table about Knee-high, and under him were placed two Pillows, one at his Head, and the other under his Hips, which laſt was then placed over the Edge of the Table, oppoſite to the Light, and his Legs being bent and ſecured with Ligatures in the uſual manner, are held firm by two Aſſiſtants (which he omits in Children) and a third Aſſiſtant is placed to hold down his Shoulders, a fourth kneels down upon the Table over the Patient, in the manner repreſented in *Tab.* XXIX. *Fig.* 9. D. with his right Hand draws up the Patient's Genitals, and with his two Fore-fingers extends the Skin of the Perinæum, by which means the Inciſion may be made more accurately, and the Catheter may be more ſenſibly perceived; and, laſtly, a fifth Aſſiſtant is placed on the left Side of the Patient, to hold and deliver the Inſtruments. All things being thus ready, our Lithotomiſt introduces a grooved Catheter made of Silver, very ſlender, and more crooked than uſual, as repreſented in *Tab.* XXVII, *Fig.* 15 *a a a*, which being firſt dipt in Oil, and paſſed into the Bladder, he therewith ſearches for the Stone, and convinces the By-ſtanders of its Exiſtence; this done, he kneels down upon his right Knee, in the manner of RAW, and with his left Hand turns the Handle of the Catheter towards the right Inguen and its Beak towards the Tubercle of the Iſchium, in which Poſition it is held as before; then he cuts thro' the Integuments between the Anus and Tubercle of the Iſchium in an oblique Direction, with a broad Knife not unlike that commonly uſed in Lithotomy, being in the ſame manner inveſted with a Slip of Linen. Having made his Inciſion, he claps the Knife into his Mouth, and paſſes his right Fore-finger into the Wound, to feel for the Catheter, which, when found, he takes his Knife, and cuts into the

Groove

Groove of that Inſtrument in the manner of RAW; then holding the Knife firm in the Groove, he, with his left Hand, preſſes the Handle of the Catheter a little towards himſelf, and, holding the Knife in his right Hand, the Edge of it follows the Beak of the Catheter as it moves inward, by which means it farther divides the Bladder, and enlarges the Inciſion. Then he delivers the Catheter to be held in that Poſition by the fourth Aſſiſtant, while he himſelf, with his left Hand, paſſes a male Conductor by the Side of the Knife into the Bladder, after which the Knife is extracted, and another female Conductor, made of Silver like the former, is introduced by the preceeding in the uſual Method; then having drawn out the Catheter, he, in the next Place, paſſes a Pair of Forceps between the Conductors into the Bladder, and extracting the Conductors, he ſearches for the Stone with the ſaid Forceps, and extracts the ſame with ſo much Dexterity, that he is hardly longer than two or three Minutes about the whole Operation. As for what Parts he cuts thro' internally, I cannot certainly determine, having never had the Opportunity of examining the Parts after him, but he has declared himſelf, that he only divides the Bladder, which ought only to be done in performing the lateral Operation, which was the Practice of RAW, as appears from what has been writ by ALBINUS and myſelf concerning that Lithotomiſt, from which Writing SANFFIUS ſeems chiefly to have learned his Method of cutting, which agrees in every reſpect, excepting that his Catheter was more ſlender and crooked, being made of Silver inſtead of Steel; his Reaſon for having it made ſlender was, that it might paſs more eaſily into the Bladder, preferring Silver on the account of its Neatneſs, and by making it more crooked than the common, he could thereby preſs the Urethra and Neck of the Bladder more outward towards the Perinæum, which makes me think that he divided not only the Bladder, but alſo its Neck.

XXVIII. In the laſt Place, M. MORAND, one of the moſt conſiderable Surgeons at *Paris*, and Member of the Royal Academy, reaſons very prudently concerning the ſeveral Methods of Lithotomy; and concludes, that all of them may be uſed by a prudent Surgeon, as the Circumſtances of his Patient require; ſo that he rather thinks the Multiplicity of Methods an Advantage, than an Incumbrance, if we regard particular Patients, and the different Circumſtances of their Caſes; therefore no one Method is to be deſpiſed or rejected, which has Reaſon and Experience to vindicate it; and he aſſerts, that all the Methods have been duly examined and performed by himſelf. But after he had publiſhed a Diſſertation in the Year 1728, concerning the high Operation, he there informs us, that he alſo deſigned to deſcribe the lateral Operation; but when he heard with what great Succeſs and Applauſe, Mr. CHESELDEN had anticipated him in that Deſign, his Inclination led him to be an Eye-witneſs of the Method and Artifices uſed by that Surgeon; in order to which he came to *London* in the Year 1729, and not only made a ſtrict Examination into the Method in which M. CHESELDEN cut his Patients, but had often Converſations with him upon the ſame Subject, and continued a Correſpondence with him after he had returned to *Paris*, where he performed the Operation firſt upon a great Number of dead Subjects, till he had found himſelf abſolutely perfect in every reſpect: He alſo tells us, that Mr. CHESELDEN had relinquiſhed the high Operation, which he had till then performed ſo ſucceſsfully, with no

MORAND on Lithotomy.

no other View than to try, if he could not improve RAW's Method, ſo as to render it preferable to the high Operation itſelf: He afterwards relates the Experiments made by Mr. CHESELDEN, partly in Imitation of M. RAW's Method, as deſcribed by ALBINUS, and partly by a previous Diſtenſion of the Bladder with Water; but he alledges, that by both theſe Methods the Urine frequently inſinuated into the cellular Subſtance of the *Membrana adipoſa*, which inveſts the Rectum, ſo as to occaſion foul and putrid Ulcers, of which ſeveral Patients had died. He alſo further adviſes from Mr. CHESELDEN, that the Aſſiſtant who holds the Catheter, ſhould not by any means preſs it outward, becauſe in that manner it may be eaſy to divide the whole Sphincter of the Bladder, nor ſhould the Wound be made too deep in the *Membrana adipoſa* near the Rectum, leſt the Urine ſhould ſtagnate and putrify there. We may alſo add, that when the Bladder is ulcerated, it may be more commodiouſly cleanſed in this Method, than by any other; and, laſtly, what is a great Recommendation to this Method of Lithotomy is, that a large Stone, which another Surgeon could not extract by MARIANUS's Method, Mr. CHESELDEN being preſent, and inlarging the Wound according to his Method, he thereby extracted the Stone with great Eaſe. After many Experiments made in the Preſence of M. MARESCHALL, late Surgeon in chief to the *French* King, in Company with many other Phyſicians and Surgeons, this Method of Lithotomy appeared to ſucceed very well at *Paris* 1730, according to the Relation of M. MORAND; ſo that out of ſixteen Patients, eight of which were cut by PERCHETUS, and the other eight by MORAND himſelf, there was but one of them miſcarried; whereas, on the contrary, out of twelve, who had been cut at the ſame Time, and in the ſame Hoſpital by the *Apparatus major*, no leſs than five of them were loſt. Among the Advantages of this Method we may reckon, with MORAND, that it is more eaſily and effectually to be performed than the Method of MARIANUS, inaſmuch as the Fore-finger proves a certain Guide to the Operator, ſo that no Danger can attend the Patient; to which we may add, that the Operation in this Way is ſhorter and leſs painful than that of MARIANUS, ſo as to admit the Extraction of very large Stones without much Difficulty. Laſtly, he pronounces RAW's Method, as it is deſcribed by ALBINUS, too intricate and difficult; and therefore doubts with DOUGLAS, GARENGEOT, and FALCONETT, whether ever RAW actually cut his Patients in that manner; and then M. MORAND concludes by promiſing to give a more perfect Account of the Method of performing the lateral Operation than we are at preſent furniſhed with.

Obſervations and Doubts concerning JAMES.

XXIX. In the next Place, MORAND relates ſeveral things, which he thinks may ſerve to illuſtrate the Hiſtory of the lateral Operation for the Stone; but as I have a long Time had a Deſire, that the Hiſtory of JAMES, and his Method of Lithotomy might be fairly ſtated, and have therefore collected ſeveral Particulars relating thereto, I muſt beg leave of M. MORAND to queſtion ſome of his Obſervations, which I have known to be otherwiſe than they appear. I ſhall therefore give in my Accounts, concerning the Hiſtory of this Method, for the Satisfaction of the curious. In the firſt Place, MORAND endeavours to prove, contrary to the received Opinion, that JAMES conſtantly cut his Patients happily, and by the ſame Method as that of Mr. CHESELDEN, and with the ſame Improvements which had been made by MERI, FAGON, and others, which

which, he ſays, will readily appear from the bare Account of his [a] Operations after they had been cenſured by MERI. To prove this Aſſertion he tells us, that, in the Year 1699, JAMES cut about ſixty Patients at *Aix la Chapelle*, the Majority of which were cured, and that afterwards in 1701 he again cut thirty Patients at *Verſailles*, who all recovered, with many more in the ſame Year in *Picardy*; but in 1703 he again cut twenty three Patients at *Paris*, none of whom miſcarried, except the Marſhal *de Lorge*. But I muſt confeſs I entertain many Scruples with regard to theſe Reports, and eſpecially concerning the Account of his Proceedings at *Aix la Chapelle*, which I cannot in the leaſt believe to be true, as having no Teſtimonies; for in the Obſervations of MERI, *pag.* 89, we are told, that JAMES was called to *Aix la Chapelle* to cut a certain Patient; that is one, and not many, as he reports. It is alſo notorious to thoſe who are acquainted with *Germany*, that the Stone in the Bladder is a Diſeaſe that ſeldom occurs in that Part; ſo that in many Cities that are much larger, and more populous than *Aix la Chapelle*, and even for ten Miles round, you ſhall hardly find one afflicted with the Stone, much leſs ſixty together in one City; and therefore from the Scarcity of this Diſorder in *Germany*, thoſe who follow the Profeſſion of Lithotomy only, get but a very poor Living by it. As for my own Country, that is *Francfort upon the Main*, I have known JAMES to ſtay there for the ſpace of ſix Months in the Year 1713, in which Time he cut only two Patients, which were all that were afforded by the whole City, and adjacent Parts, as we ſhall hereafter make more evidently appear; therefore this Relation of MORAND, whoever he had it from, does not appear to be true. As for his having cut ſo many with Succeſs at *Paris* and *Verſailles*, in the Years 1701 and 1703, I very much doubt the Fact, inaſmuch as we have no Notice taken of it either by SAVIARD, Surgeon to the *Hôtel Dieu*, who publiſhed his Obſervations upon the Subject in 1702, nor by DIONIS, Surgeon to the King, whoſe Surgery was publiſhed at *Paris* in 1707, he does not ſo much ſpeak a Word of JAMES's performing the Operation ſo frequently with Succeſs, tho' he lived at *Paris*, and was often preſent at the Performances of that Lithotomiſt; but, on the contrary, thoſe two Authors, and eſpecially the laſt, greatly diſapprove of his Method of cutting, as raſh and cruel, and reckon its Author, as alſo doth SAVIARD, to be a raſh and imprudent Operator, as appeared from opening the Subjects deceaſed after his Operation; which Character would not have been given by DIONIS, as I at leaſt imagine, if he had before ſucceſsfully recovered ſuch a Number by his Operation at *Paris*, and the adjacent Parts; he durſt not have been guilty of ſuch a falſe Aſſertion, or at leaſt Contradiction, in a Book at that Time uſhered into the World with the Approbation of the Cenſors, and dedicated to the King himſelf, while the Exploits of JAMES were yet freſh in Memory. We may further obſerve, that M. MORAND laments that Frier JAMES's Method of Lithotomy had not yet been examined by any beſides MERI; but, with his Leave, it had been alſo conſidered by BUSSIERE, LISTER, SAVIARD, LAUNEAU, and DIONIS, who all at that Time reſided at *Paris*,

[a] Though there are ſeveral Reaſons before-mentioned to make one think, that this Method of cutting for the Stone was not the Invention of JAMES, who rather learnt it from ſome body more ſkilful than himſelf; yet I preſume the Hiſtory of him will not be unacceptable to our Reader.

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and were Eye-witneſſes to his Performances; it therefore appears, by the unanimous Conſent and Declaration of theſe Authors, that JAMES had no Merit, and as little Succeſs in his Undertakings; conſult what has been ſaid from SALTZMANNUS in § X. who relates, that JAMES in 1712 confeſſed to him, that he had hitherto proceeded wrong in his Operations, and had not performed them as he ought 'till of late.

MORAND concerning JAMES in *Holland*.

XXX. There are alſo ſeveral things related by MORAND concerning his Performances in *Holland*, and particularly that at *Amſterdam* in 1703, he cut for the Stone with ſo much Succeſs and Applauſe, that he was rewarded by the Magiſtrates of that City with a golden Medal, having the following Inſcription, *Pro Servatis Civibus*, which Medal was afterwards ſtruck in Braſs; but for myſelf, who reſided in the ſame City in the Spring of the Year 1706, I could not learn any thing of this Medal, nor that our Lithotomiſt met with any Succeſs there, tho' I have frequently enquired after him in my Converſations with the moſt eminent Phyſicians and Surgeons at that Time in the Place; I would therefore aſk MORAND, from whence he had this Intelligence? On the contrary, it appears from the funeral Oration of RAW, read at *Leyden* by ALBINUS, that JAMES had there performed his Operation with very bad Succeſs, committing the ſame Errors which he had done before at *Paris* 1698. A celebrated *Dutch* Phyſician, who at that Time lived in *Holland*, has lately, at my Requeſt, ſent me an Account of what he knew concerning that Lithotomiſt; his Letter of *December* 1737 mentions, that JAMES BEAULIEU was at *Amſterdam*, and there cut for the Stone in the Year 1699, meeting at firſt with univerſal Applauſe, but afterwards came into Diſgrace; however, he received a golden Medal relating to his Profeſſion, with an Inſcription, *Ob Cives Servatos*; from whence he went to *Leyden*, and was taken into the Hoſpital there by CAROLUS DRELINCURTIUS Junior; here he at firſt cut for the Stone with ſo much Applauſe, that he was by many extolled to the Skies; but was ſoon afterwards deſpiſed by every body, and condemned for an audacious, raſh, and cruel Operator. RAW at that Time publiſhed Journals of the Succeſs, which the Operation had upon thoſe who were cut by this *French* Lithotomiſt, whoſe Proceedings being laid open, demoliſhed his Reputation, ſo as to make him leave the Place, in which Office RAW was happily employed with very great Applauſe, and retained it till his Death. However, this did not ſink the good Opinion of JAMES in the Eyes of the Populace, who looked upon him as a Perſon ſent from God, and were greatly taken, partly with his eccleſiaſtick Habit, and partly becauſe he cut his Patients *gratis*, ſo that the Magiſtrates, to prevent any Tumults in the City, prudently endeavoured to mollify the ſevere Repreſentations made by RAW in his Diary, much to the Diſlike of the common People, by preſenting him with the golden Medal.

VERDUN's Account of JAMES.

XXXI. That nothing may be wanting in the Hiſtory of JAMES, and eſpecially with regard to his Performances in *Holland*, I have here added a brief Account of what has been ſaid by VERDUN, in a letter to me, dated *December* 1737. He ſays, that JAMES was born of poor Parents, and never learnt any thing of Surgery regularly, but was Servant, as I before ſuſpected, to an itinerant Lithotomiſt and Mountebank, who for a long Time followed the Camps, where JAMES had an Opportunity of making Trials upon the dead Bodies after Battle, that he might be better enabled to perform it afterwards

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on the living, and having performed ſeveral Cures in *France*, and particularly at *Aix la Chapelle*, his Fame quickly ſpread into *Holland*, and he was called from *Paris* to undertake the Cure of a Sarcocele in a *Dutch* Nobleman at *Zutphen*, where, being arrived, he performed the Operation in Preſence of BIDLOE, and in the ſame Place he cut ſeveral for the Stone, and performed the Operation for Ruptures. By that Time the Nobleman was about half cured, VERDUN, both Father and Son, received Intelligence from the Patient's Brother, that JAMES was coming to *Amſterdam*; and therefore deſired, that the celebrated Perſon might have Recommendations ſuitable to his Merit; and accordingly GUERELL, chief Phyſician to the Hoſpital at *Amſterdam*, with ſeveral other Perſons of Merit and Diſtinction, had a Meeting in the Houſe of the Brother to this Nobleman, where JAMES had arrived, and where they converſed with him, and viewed his Inſtruments; his Catheter, we are told, was then without any Groove, and his firſt Operation was performed upon a Lad, who was Waiter at a capital Inn, where alſo aſſembled, by Order of the Senate, BERNARGIUS, then Profeſſor of Surgery, together with the chief Phyſicians of the Hoſpital and City; here he performed his Operation with ſo much Slight and Dexterity, and in ſo ſhort a Time, that it raiſed an Admiration in all that were preſent, and made them praiſe and extol our Operator, even before the Senate.

His Account of JAMES's Practice in *Holland*.

XXXII. JAMES uſed to cut for the Stone at *Amſterdam* in the following manner: Having firſt paſſed his Steel Catheter without a Groove into the Patient's Bladder, he preſſed the Beak of it towards the left Side of the Perinæum, and then made an Inciſion with a ſharp Knife near the left Side of the Anus, 'till his Knife had reached the Catheter, he then enlarged the Inciſion, by cutting on the right Side of the Catheter; obſerving that all the Parts between the Skin and Catheter, were clearly divided, and in drawing back his Knife, he uſually made the external Wound ſtill larger: In the next Place, he ſearched for the naked Catheter with his left Fore-finger, and thereby paſſed a Conductor made with a Ring, and ſharp pointed, into the Bladder, after that another Conductor, between which he paſſed the Forceps, whereby he afterwards extracted the Stone. And this is the Method in which he performed Lithotomy daily, under our own Inſpection; but, ſays VERDUN, it was hardly poſſible for him to cut ſuch a Number, without committing a great many Errors, eſpecially by his too great Haſte. Soon after this, JAMES procured ſome grooved Catheters to be made for him, tho' he hardly ſtaid three Weeks in a Place, but was continually travelling through the Southern Parts of *Holland*, particularly to *Harlem*, *Leyden*, *Delph*, *Rotterdam*, &c. [a] where he frequently performed his Operation for the Stone and for Ruptures; but upon returning again to *Amſterdam*, he met with few or no Patients; ſo that, after about ſeven Weeks Stay in *Holland*, JAMES was deſirous of returning again into *France*. VERDUN therefore conducted him to *Duke's Park*, where they ſtaid three Weeks, and had ſuch a Concourſe of Patients, that our Lithotomiſt ſometimes cut ſixteen in an Afternoon, among whom was an Infant of a Year old, who had a Rupture on both Sides from its Birth; but it is to be lamented, ſays VERDUN,

[a] Hence it appears, that he was continually changing his Abode, removing from the laſt Place to another, without waiting to ſee the Cure of his Patients compleated.

by way of Joke, that this Infant died the Day after, becauſe, ſays he, as the Child was caſtrated of both Teſticles, it might have made a good Singer. We are alſo told by VERDUN, that it was in this Place our Lithotomiſt was preſented with a golden Extractor (*Lapidillium*) by the Senate of *Amſterdam*, which had been made according to his Orders given before he left that City; he alſo received along with the Inſtrument a Letter from the Senate, ſignifying their Reſpect; upon the Back of the Inſtrument was engraved the Arms of *Amſterdam*, a Crown embeliſhed with Oak-leaves, over which were the Words *Ob Cives Servatos* [b].

XXXIII. VERDUN being returned home, made Enquiry into the bad Effects which remained after JAMES's Lithotomy, in thoſe Patients which he had left behind; for the Lad that was firſt cut with ſo much Dexterity by him, and procured him ſo much Reputation, was ſtill in a very indifferent Way. Many others were dead in the mean time; ſome were perplexed with a Fiſtula in Perinæo; others with an Incontinency of Urine, and ſeveral other bad Symptoms. It is alſo remarkable, that he more than once performed his Operation, without being able to find the Stone, and from one Patient he indeed extracted three Stones, but left two others ſtill behind in the Bladder; in one Patient the Fæces were diſcharged through the Wound and the Urethra; but the moſt deplorable Caſe of all, ſays VERDUN, happened to be at the *Hague*, under my own Obſervation, where ſearching for a Stone in Lord DE EYTHUYSEN, and finding one, he performed his Operation upon that Nobleman at half an Hour after ten the ſame Night, without being able to find or extract any Stone, after a long and fruitleſs Search; but about fourteen Days afterwards, VERDUN received a Letter from REVERHORST, a celebrated Phyſician at the *Hague*, ſignifying that, upon opening the dead Body of the ſame Nobleman, he had found ten large Stones in his Bladder; from all which VERDUN concludes it to be ſufficiently apparent, that JAMES treated his Patients in a raſh and barbarous manner.

Account of JAMES by SERMESIUS and SALTZMANNUS.

XXXIV. But to make it appear more evidently in what an injudicious and baſe Method JAMES cut for the Stone while he was in *Holland*, I ſhall here produce the Accounts given of him by SERMESIUS and SALTZMANNUS, who lived upon the Spot. The latter relates that, in the Year 1712, JAMES cut ſixteen Patients with Succeſs at *Straſburg* [c], where, upon taxing him with his former Errors, JAMES replied: "It is true indeed that I formerly cut in a bad "Method; but I have performed it in a more correct manner for above this "twelve Month paſt." SALTZMANNUS alſo informs me, that JAMES returned to the ſame City above two Years aftrewards, but met with few Patients, and that even then he did no more than cut the Patient, and extract the Stone, being ignorant of the Method of dreſſing up the Wound, and removing the bad Symptoms, which was therefore taken care of by other Surgeons in that Place, as it had been before at *Paris*. It is alſo obſervable, that he uſed a common Knife to cut his Patients at *Straſburg*, of the ſame Form with that we uſe

[b] Hence we learn, that it was an Inſtrument that was preſented to JAMES, and not a golden Medal, as MORAND relates.

[c] The ſame Account is alſo confirmed by D. GOECKELIUS, a celebrated Phyſician now living at *Norimberg*; but at that Time he lived at *Straſburg*, and was preſent when JAMES performed his Operations there.

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to our Victuals[d]; but that his Catheter was made with a Groove, and very crooked, with which he employed a hollow Conductor like the common Gorgeret, only with this Difference, that its End was made with a Button, instead of a Point, and a Ring instead of a cruciform Handle, wihch Instrument he conveyed into the Bladder over his right Fore-finger before he extracted his Catheter, and then introduced his Forceps through the Cavity of the Conductor. After having examined the Situation, Figure, and Size of the Stone with his Finger, he then chose a Pair of Forceps sizable to the Patient, which Forceps were made flatter than the common, and furnished with a Ridge internally near the Edge, and without Teeth, least they should pinch and hurt the Bladder; Figures of which Conductors and Forceps were lately sent me by Dr. TREW, Physician at *Norimberg*.

Doubts concerning JAMES.

XXXV. From the same Letter we are also enabled to remove another Error which MORAND relates, *viz.* that JAMES, being fatigued with his many Journeys, returned into his own Country and Town of *Besançon* in the Year 1712, where he died about the Year 1714; whereas, according to SALTZMANNUS, he performed his Operation at *Strasburg* in the Year 1715, himself being present, and therefore MORAND must have been in an Error with respect to the Time; and he seems to have been altogether ignorant of JAMES's Proceedings both at *Francfort* and *Strasburg*, JAMES surviving the Time which MORAND had fixed for his Decease, since he was alive at *Strasburg* in 1715, which is still more confirmed by LE MAIRE, JAMES's Countryman, who says, that he lived a long Time after this at *Besançon*, till he was seventy Years of Age.

The Time of JAMES's coming into *Holland*.

XXXVI. As for the Time which JAMES continued in *Holland*, that may be collected from the Account we have of his leaving *Paris*, to perform his Operation at *Amsterdam* in the Year 1697. It is probable he resided in that City when RAW began to teach his Anatomical and Chirurgical Demonstrations, since RAW was frequently present at his Operations, and, from the most authentick Accounts, we may fix the Time to be about 1703.

An Error in the Time corrected.

XXXVII. However, we are told by others, and particularly by the Author of the Preface to COLOTT's Lithotomy, that RAW learned his Operation from JAMES at *Paris*, which is apparently an Error, as many can testify, that after RAW came out of *France* into *Holland*, in the Year 1694, he never returned there again, but after he had settled at *Amsterdam*, he constantly lived in *Holland*. I shall conclude by fixing the true Time when JAMES came into *Holland*, as it was sent me by a celebrated *Dutch* Physician, whose Name must be concealed at his Request, and who, with the expert Surgeon of *Amsterdam*, VERDUN, fixes the Time to be in the Year 1699, when he first came into *Holland*, and performed his Operation.

The History of JAMES imperfect.

XXXVIII. It were to be wished, that we had a complete History of the Life of this celebrated Lithotomist, and his Proceedings, to perform which the *French* Surgeons are the most capable, as their Country was the Place of his Birth, the major Part of his Life, and Decease. I have endeavoured, for my own Part, to relate what Accounts I could collect of him, with regard to his Life and Proceedings in *Holland*, wherein I particularly remarked several things of Conse-

[d] But I cannot hence determine what Figure his Knife was of, since that of our common Knives differs very much.

quence, which have been either falſly repreſented, or totally neglected by others. DOUGLAS has indeed uſed his Endeavours to give us the Hiſtory of this Lithotomiſt, in his Diſſertation upon the *Lateral Method*; but as he himſelf there confeſſes, there are many things wanting to compleat the Hiſtory, which he could get no Intelligence of, and, among others, the particular Time of his coming into *Holland*, which I have here endeavoured to aſcertain.

Diſadvantages of the *Lateral* Method.

XXXIX. Notwithſtanding the Encomiums which the *lateral* Method has at this Day acquired, there are yet ſeveral Difficulties and Inconveniencies to which this Method is equally liable with the *Apparatus major*; ſuch as (1.) a Fiſtula in Perinæo; (2.) a tranſverſe Poſition of an oblong Stone of a large Size, the Figure of which cannot be known before the Operation is performed, to extract which the Operator frequently puts the Patient to extreme Torture, without effecting any thing, which may at the ſame Time be eaſily performed by the high Operation. (3.) The Stone's being ſituated above the *Os pubis* in the Form of an Arch, and faſtened to the Bladder, in ſuch a manner that it cannot be ſeparated without endangering the Patient's Life; an Inſtance of which has been remarked by SERMETIUS and myſelf. (4.) When the Stone is very ſmall, and lodged in ſome Cell in the Bladder, or is broke in pieces, which render it very difficult to be extracted by this Method, and is a Difficulty that has been met with both by RAW and SERMETIUS[e]. (5.) This Method is not practicable when the Catheter cannot be paſſed into the Bladder by reaſon of ſome Obſtacle. (6.) The Bladder is liable to be injured, pinched, or punctured by the Inſtruments. (7.) The lateral Operation is hardly practicable in Women, eſpecially Adults, without great Hazard of wounding their *Vagina*, nor have we any Inſtance of the Operation ſucceeding in them; unhappy Inſtances of the contrary, we have indeed ſeveral, in the Practice of JAMES before taken notice of[f]. See alſo SERMETIUS upon this Head, *pag.* 182. who performed this Operation upon many dead Subjects of that Sex; but in none of them without wounding the *Vagina*; and therefore upon this and ſeveral other Accounts the high Operation is in many Caſes preferable to the lateral.

Lithotomy a hazardous Operation.

XL. After all, it appears that the Operation of Lithotomy is precarious and dangerous, or its Event at leaſt very doubtful, notwithſtanding all the Improvements which have been lately made on it by ſeveral celebrated Phyſicians and Surgeons; nor is there any one Method to be relied on alone, but all of them are practicable to more or leſs Advantage, according to the particular Circumſtances of the Patient's Caſe; and therefore a prudent Surgeon ought to be well acquainted with the manner of performing all the Methods.

Cautions for chuſing the Method.

XLI. The *Apparatus minor* does not well ſucceed when the Stone is full of Prickles, nor when it is ſo large as not to be conveniently held by the Fingers, nor does it ſucceed well in very tall Patients, becauſe in them the Bladder is ſo far diſtant from the Anus, that the Stone cannot be felt, and thruſt towards the Perinæum; in which Caſe I judge the lateral Method more convenient. On the contrary, in Children, and ſmall adult Patients, where the Stone is not very large nor prickly, and where it may be eaſily thruſt to the Perinæum, we muſt

[e] Small Stones and Fragments are ever acknowledged by M. DENYS to be very difficultly extracted by the Lateral Method.

[f] RAW mentions one Woman that he cut in this Method; but I remember no other Inſtance.

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needs think the old Method of cutting by the *Apparatus minor* to be moſt eligible, as it is very ſimple, and performed by few Inſtruments, notwithſtanding what others ſay in Oppoſition to it; and particularly when the Stone is fixt in the Neck of the Bladder, it is then the moſt convenient and proper of all others. The high Operation, we are aſſured by Experience, to be very dangerous in old and weak Patients, whoſe Strength is exhauſted, and their Bladder ulcerated, as we have before obſerved §. XXI. Whereas, on the contrary, it ſucceeds very happily in Children and young Men, tho' the Stone be very large, as it does alſo when the Stone is very ſmall, ſo that it can hardly be found by other Methods, and when there are ſeveral ſmall Stones, or Fragments, each of them may be commodiouſly extracted by this Method, being careful not to wound the Bladder. Though the Inciſion may be more eaſily performed, and with leſs Danger in the *Apparatus major*, than in the lateral and high Operation; as in the firſt the Urethra only is wounded, yet we cannot judge that Method to be uſeful, or even practicable, except when the Stone is ſmall and of a ſmooth Surface; but when it is large and rough, there is Danger of a violent Extention, Laceration, and Contuſion of the Neck of the Bladder; but if the Bladder be ulcerated, and the Stone not very large or rough, I then think it preferable to the high Operation, as the Bladder may be better cleanſed by an opening in its lower, than upper Part. As for the lateral Operation, as it ſtands improved by JAMES, RAW, and CHESELDEN, it excells the *Apparatus major*, as being practicable in leſs Time, and may be uſed for extracting very large Stones; but as the Wound is made in the Bladder itſelf, and penetrates much deeper than in the lateral Method of MARIANUS, in which the Urethra only is divided in the Perinæum, I muſt therefore think it more difficult and dangerous. For as the Inciſion is to be made very deep through the Parts which inveſt the Bladder, there is great Danger of the Knife's ſlipping out of the Groove of the Catheter, eſpecially in fat Subjects, ſo as to endanger a Wound of the Rectum, ſeminal Veſicles, and other adjacent Parts, or even the Bladder itſelf, as frequently happened to JAMES[g]. The *Apparatus major* is a dangerous and difficult Operation, as a large Stone cannot be extracted without a violent Extenſion, and perhaps a Laceration of the Neck of the Bladder; for when the Neck of the Bladder and proſtate Gland, with the Sphincter and Urethra, are forcibly diſtended, or lacerated by a large or rough Stone, there is great Danger of a profuſe Hæmorrhage, violent Inflammation, and incipient Mortification, if not a Cancer in the Bladder itſelf, or at leaſt a Fiſtula in Perinæo, followed with other Diſorders. So that it is hence apparent, that one Method is preferable to the other, only as it is more or leſs adapted to the particular Caſe of the Patient. In the Method of MARIANUS, and in that only, it is that the Bladder is not wounded in cutting for the Stone: in that Method the Urethra only is divided; whereas in all others, the Bladder itſelf, and even its Body, is inciſed. In the high Operation the inferiour and anteriour Part of the Bladder is divided; but in the *Apparatus minor* and lateral Method of cutting, the Blad-

[g] Though the *Veſiculæ ſeminales* may be, and very often are, wounded both in the *Apparatus minor*, and in the *Lateral* Operation, as LE DRAN and others have obſerved; yet it is not generally attended with any bad Conſequence, as the Parts readily heal up with the reſt that are divided.

der

der is inciſed in its inferiour and lateral Part; ſo that theſe three Methods differ more in their Inſtruments, than in the Places of Inciſion, which are pretty near each other.

The Stone ſometimes returns.

XLII. Laſtly, it is to be obſerved that Patients, who have been once happily cut and freed from the Stone by any Method, are notwithſtanding frequently troubled with the ſame Diſorder again: Thus I remember a Lad, who had been three times cut and freed from the Stone by RAW; and, to inſtance one Caſe out of many, a certain Merchant near *Norimberg*, was obliged to be cut four times, a new Stone being formed every Year, notwithſtanding he was conſtantly under the Care and Treatment of a prudent Surgeon. In like manner M. DENIS mentions a Man that was five times cut for the Stone, a very large one being extracted at each Operation. But People ſhould be careful not raſhly to attribute this Relapſe either to the Imprudence or Ignorance of the Lithotomiſt, as it is ſometimes maliciouſly reported to the Damage of his Reputation; for it is in the Power of no Phyſician to prevent the Patient from ever relappſing into the ſame Diſorder, though he may make a perfect Cure of him for the preſent: if the original Cauſe of the Stone ſtill continues in the Patient's Habit, eſpecially a bad State of the Kidneys and Bladder, it will in Time again produce the ſame Conſequence or Diſorder, which will again make it neceſſary to repeat the Operation, if the Patient is deſirous of being freed from his Complaint.

An EXPLANATION *of the* THIRTY-FIRST PLATE.

Fig. 1. Repreſents a lateral View of RAW's grooved Catheter, as it is delineated in its true Figure and Thickneſs by ALBINUS. But it is to be obſerved that, in the Years 1706 and 1707, when I was his Pupil, he uſed a common grooved Catheter, like that repreſented in *Tab.* XXVII, only it was a little thicker than the common ones; A denotes a lateral View of its Handle; B the Part which ALBINUS aſſerts to be more crooked than the common ones; though in my Opinion it ſeems to be leſs crooked than thoſe which have been figured, for the *Apparatus major*, by TOLET, ALGHISH, GARENGEOT, LE DRAN, myſelf, and others. C denotes the Beak of the Catheter, which is longer and ſtraighter than the common.

Fig. 2. Exhibits a flat View of the Handle of this Catheter, which may as well be made in the Form of a Heart like that of the common one in *Tab.* XXVII. or elſe flat and ſolid, as that of Mr. CHESELDEN in *Fig.* 6. *Tab.* XXXI. or with a Ring like that of M. LE DRAN in *Fig.* 17. *a a* of this Table.

Fig. 3. Repreſents the Beak or grooved Part of RAW's Catheter, in which may be ſeen its thin, but ſmooth and obtuſe Sides marked *a a.* betwixt which is the large Groove marked *b b.* C is the Termination of the Groove, in a ſmooth and obtuſe Point.

Fig. 4. Is a tranſverſe Section of the grooved Part of this Catheter, to ſhew its Form and Depth, that the Knife may not eaſily ſlip out of it.

Fig. 5. Exhibits the grooved Catheter of Mr. CHESELDEN, which is more ſlender, and leſs crooked than that of RAW's and the common ones: *a a* denotes the Edge of its Handle in the Shape of a Heart: *b b* the Body of itin a rectilinear Form: *c c* the Curve and grooved Part: *d* the Beak of the Inſtrument, which has little or no Incurvation. DOUGLAS calls it the Roſtrum or Beak, which is ſtrait.

Fig.

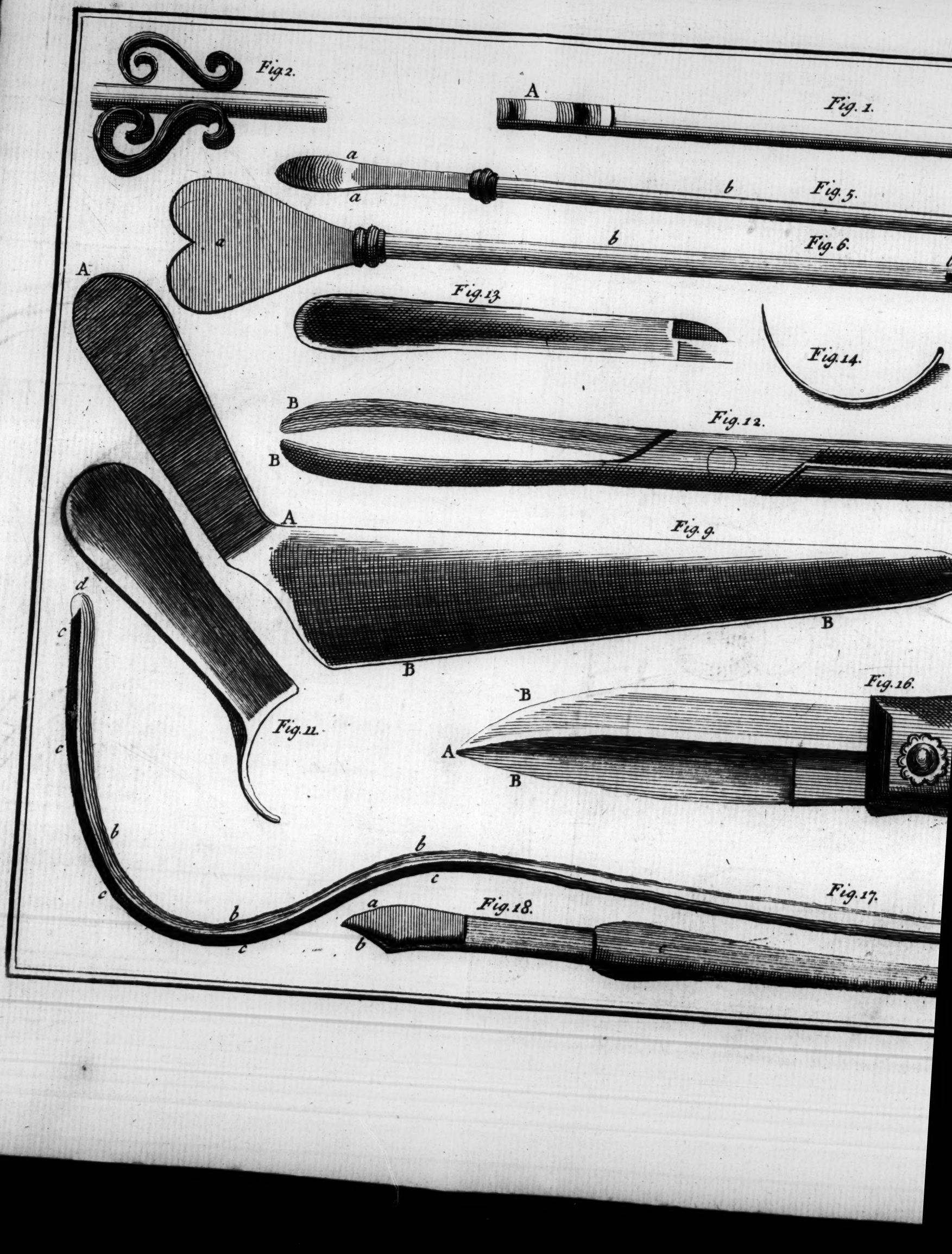
Fig. 2.
A
Fig. 1.
a
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Fig. 5.
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Fig. 6.
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Fig. 13.
Fig. 14.
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Fig. 12.
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Fig. 9.
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Fig. 11.
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Fig. 17.
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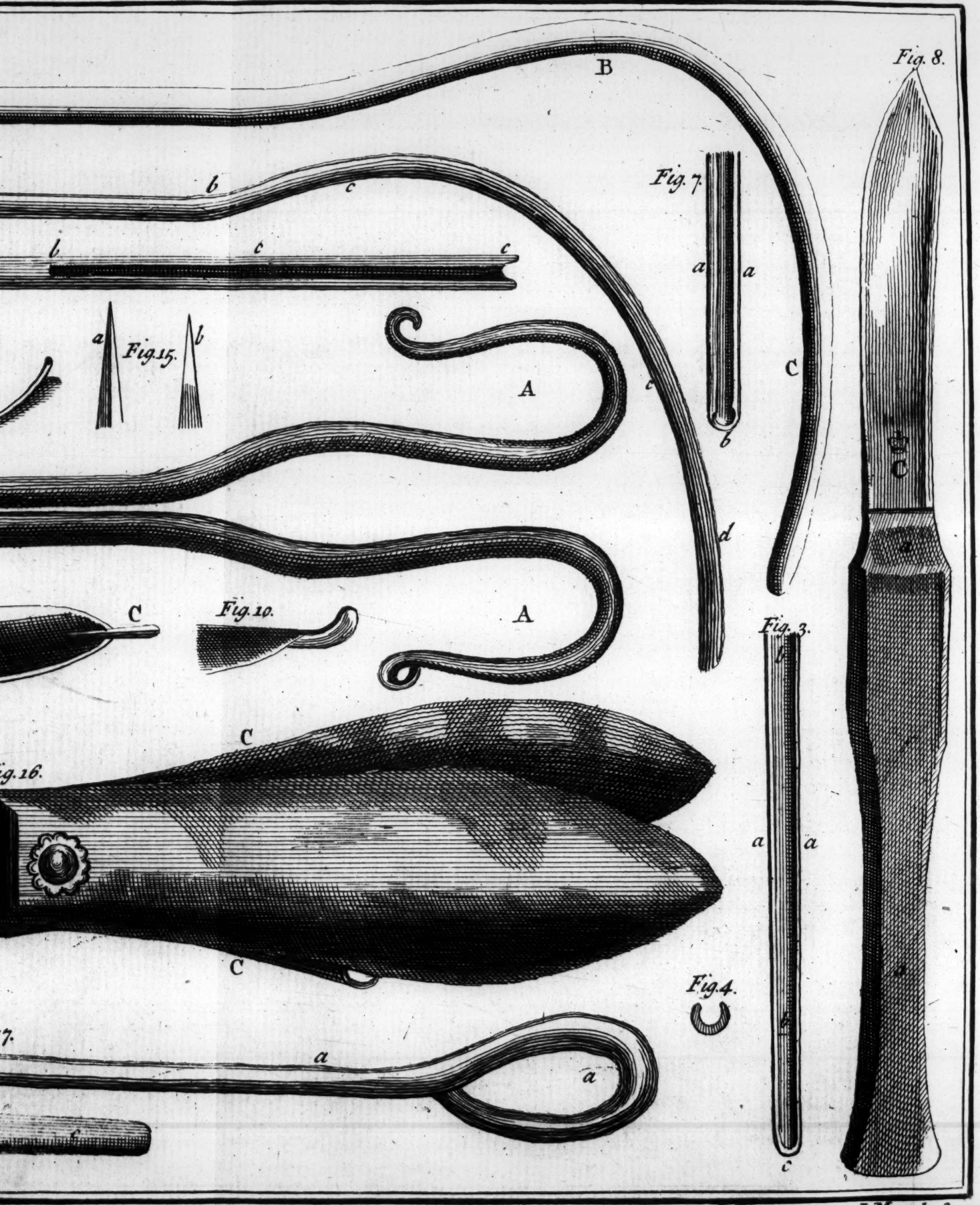
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Fig. 15.
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Fig. 10.
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Fig. 8.
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Fig. 3.
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C
Fig. 16.
Fig. 4.
a
a
c

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Fig. 6. Repreſents the flat Side of the Handle *(a)* of this Catheter, with Part of its Groove *(c c)* and its whole Body *(b b)*.

Fig. 7. Denotes the ſtrait Beak of the Groove in Mr. CHESELDEN's Catheter, whoſe Sides (marked *a a*) are ſmooth and obtuſe like RAW's; but its End *b* is left open, and not made rounding or cloſed, as in the other Catheters. But I am not ſenſible of any Advantage that attends this particular Make, nor does its Author mention any.

Fig. 8. Is the Inciſion-knife of Mr. CHESELDEN, which he uſes in cutting for the Stone; whoſe Blade is fixed to the Handle *a a*, and its Point directly in the middle.

Fig. 9. Shews the concave Part of Mr. CHESELDEN's Conductor B B. having its Handle A A inclined to the left Side, for the more commodious Introduction of the Forceps through it into the Bladder; C the Extremity of its Beak terminating in a flat Point, ſhewn ſide-ways in *Fig.* 10, and in *Fig.* 11. its Handle is repreſented ſeparate.

Fig. 10. Repreſents the common ſmall Forceps of Mr. CHESELDEN, which he moſt frequently uſes for extracting the Stone. But when the Stone is very large, he uſes a Pair three Inches longer. A A denote its Handles, which in others are uſually in the Form of Rings, but are here bent in the Form of Hooks. In his larger Forceps he repreſents one Handle in Form of a Ring, and the other like a Hook, as here. B B are the two Jaws or Lips of the Forceps, which are made ſo as not to ſhut quite cloſe, that they may not pinch and injure the Bladder.

Fig. 11. Repreſents the internal Surface of one of the Jaws of theſe Forceps, which is concave, and furniſhed with many ſmall Teeth, inclining backward towards its Handle, that it may hold the Stone firm.

Fig. 12. Gives a lateral View of one of Mr. CHESELDEN's Needles, which he uſes to take up any Artery that may happen to be divided in the Operation.

Fig. 13. Shews the convex and angular Point of the ſame Needle marked *a*; *b* its concave or internal Part, which is ſmooth.

Fig. 14. The Biſtoury, or Inciſion-knife of M. LE DRAN. A its Point, BB its two Edges for cutting, C C its two Handles.

Fig. 15. Repreſents a new Catheter of M. LE DRAN, which he uſes for the lateral Operation inſtead of RAW's: *aa* its Handle: *a b* its Body: *b b b* its concave or crooked Part: *c c c* the Groove in its convex Part, *d* its obtuſe Point cloſed; the Lines at *e e* denote the Length of the Fiſſure in its Groove.

Fig. 16. Exhibits GARENGEOT's Scalpel for Lithotomy by the lateral Method.

CHAP. CXLIV.

Of Puncturing the Perinæum and Bladder.

Puncture of the Perinæum what and where neceſſary.

BY the Puncture of the Perinæum is underſtood a Paracenteſis or Perforation made into the Urethra and Bladder, in order to diſcharge the Urine when it is ſuppreſt. But as this Perforation is at preſent made, as well in the Hypogaſtric

gaſtric Region above the *Oſſa pubis*, as below it in the Perinæum, it would in my Opinion be more proper to term it a Punctuation or Paracenteſis of the Bladder, which is an Operation of ſo much Conſequence, that if it be not timely performed, the Patient muſt inevitably periſh; but at the ſame time it is an Operation ſo dangerous, that no one ſhould preſume to perform it, who is not an expert Anatomiſt, and a dexterous Operator. The Puncture of the Perinæum is therefore uſed only in thoſe Suppreſſions of the Urine [h] where it cannot be diſcharged by the Uſe of internal Medicines, nor be evacuated by introducing the Catheter; for there may be ſome Caſes in which the Catheter cannot be paſſed into the Bladder, even by an expert Surgeon, as appears from conſtant Practice, and has been before obſerved in *Chap.* CXXXVII. But that the Surgeon may not be ignorant of the Cauſes, which may prevent the Paſſage of the Catheter into the Bladder, he ſhould obſerve that it may proceed, 1. From a violent Inflammation of the Neck and Sphincter-muſcle [i] of this Receptacle, whereby the natural Paſſage of the Urine is ſometimes ſo cloſely contracted, that the Catheter can by no means be paſſed through it into the Bladder [k], and, if forcibleEndeavours be uſed for that purpoſe, it frequently not only increaſes the Inflammation and Pain, but ſometimes alſo contuſes the Urethra, ſo as to bring on an incipient Mortification, and Death itſelf [l]. 2. The Paſſage may be obſtructed by ſome Caruncle, Cicatrix, or a hard Tubercle. 3. It frequently proceeds, in old Men, from a Stricture or Shrinking of the Urethra, or by forming Wrinckles ſo as totally to block up the Paſſage of the Urine. 4. It may be cauſed by too great Diſtenſion of the ſpungy Subſtance of the Urethra with Blood, whereby its Canal may be ſo cloſely compreſt, as frequently to deny a Paſſage to the ſmalleſt Tube. 5. It may proceed from a Schirroſity, or preternatural Tumor of the proſtate Gland, which has been obſerved by the celebrated MORGAGNI [l], alſo by COLOTT, and lately by myſelf in a Man at *Helmſtadt.* 6. It may be occaſioned from a Stone wedged into the Urethra, or Neck of the Bladder, ſo that neither the Urine nor Catheter can have any Paſſage. Therefore in any of theſe, or the like Caſes, when the Urine cannot be diſcharged from the Bladder, neither by paſſing the Catheter, nor exhibiting Medicines recommended in *Chap.* CXXXVII. the Surgeon muſt then have imme-

[h] A Suppreſſion of Urine may proceed either from (1.) a Diſorder in the Kidneys; in which Caſe no Urine is traſmitted to, or retained in the Bladder; and therefore no Operation in Surgery can be of any Service here; or (2.) it may proceed from ſome Diſorder in the Bladder or Urethra, as we ſhall here obſerve. If the Urine remains ſuppreſſed in the Bladder, (which may be known by the Pain and Tumor it occaſions in the Region above the *Oſſa pubis*, with a Weight and Reſiſtance upon the Rectum perceptible to the Finger there) there are then three Methods of diſcharging the Urine, either, firſt, by the Catheter, when that can be introduced into the Bladder, for which conſult Chap. CXXXVII, Or, ſecondly, by Lithotomy, when a Stone is the obſtructing Cauſe; of which Operation we have largely diſcourſed in the preceding Chapter; or, laſtly, by an Inciſion or Puncture in the Perinæum, which we ſhall conſider in the preſent Chapter.

[i] This may be known by the Heat and Pain felt by the Patient in his Perinæum, eſpecially upon any Preſſure there with the Finger, *&c.* and it will be ſtill more ſenſible to the Surgeon, if he introduces his Finger into the Patient's Anus.

[k] What Medicines are proper to be uſed in Suppreſſion of Urine from an Inflammation of the Parts, before our Chirurgical Helps are called in, we intimated before in Chap. CXXXVII. §. 1.

[l] See his *Adverſaria Anatomica* III. *pag.* 83. where he has obſerved a fatal Suppreſſion of the Urine from this Cauſe. But he does not ſay whether this Operation had been performed.

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diate recourſe to the preſent Operation, or the Patient will be inevitably loſt.

II. There are ſeveral Methods to perform this Operation, each of which we ſhall briefly deſcribe. LEAUNEAU tells us, there is nothing more required in this Operation, than to place the Patient in the ſame Poſture as in cutting for the Stone, and then to make a large Inciſion in the Perinæum, cutting through the Urethra into the Groove of the Catheter, as in the *Apparatus major*, after which he paſſes a Conductor or Gorgeret in the Groove of the ſame Catheter, gently paſſing it through the Neck of the Bladder, ſo as to make way for the Urine. But LEAUNEAU does not conſider, that this Operation is not neceſſary when the Catheter can be paſſed into the Bladder; for then the Urine may be diſcharged through its Cavity without cutting, which ought only to be performed when that Inſtrument can find no Admittance into the Bladder. I ſhall therefore proceed to deſcribe the Methods which are to be uſed, when the Catheter cannot by any means be introduced; the firſt and moſt common of theſe Methods, which has been hitherto uſed, as well by the Ancients as Moderns, is as follows: See DIONIS's Chirurgical Operations, Demonſtration III. the Patient is firſt to be placed upon a Bed or Table in the ſame Poſture as in cutting for the Stone, being ſecured by two or three Aſſiſtants, after which the Surgeon makes an Inciſion on the left Side of the Suture in the Perinæum, with a ſmall and double-edged Knife, like that repreſented in *Tab.* I. *lit.* I. with which he cuts down into the Bladder, and if the Urine ruſhes through the Wound, 'tis a certain Sign of his having entered the Bladder, but he ſhould not draw out his Knife before he has paſſed a Probe or Silver-Tube by the Side of it into the Bladder, which Tube may be about four Fingers Breadth, made like that repreſented in *Tab.* II. *lit.* P. *Tab.* XXIV. *Fig.* 3. or in *Tab.* XXXII. *Fig.* 4. which Tube being left in the Wound, is to be there held firm by a flat Bandage paſſed round the Hips, and, after the Urine is thereby diſcharged, the Tube is to be ſtopt with a Tent, to prevent it from continually flowing out. Whenever the Patient wants to make water, the Tent is then to be extracted, and afterwards inſerted into it again: which Proceſs is to be repeated when neceſſary, till the Inflammation, and other Symptoms of the Diſorder, are all removed. This firſt Method is indeed ſomewhat dangerous and ſevere, becauſe thereby the Neck of the Bladder and Urethra are generally cut through without any Neceſſity, whereby the Inflammation becomes more violent, and at the ſame time alſo the ſeminal Outlets in the proſtate are uſually very much injured.

First Method of puncturing.

III. It is therefore a ſafer and more commodious method in my Opinion, if the Inciſion is made in the ſame Part of the Perinæum, and with the ſame Inſtruſtruments, as are cuſtomary in the *Apparatus minor*, or in the lateral Operation, cutting into the Body of the Bladder, without injuring its Neck, after which a Silver Tube may be introduced, and the Urine diſcharged as before; by which means the Neck of the Bladder and Urethra are preſerved entire, and the Pain and Inflammation are not increaſed, but the Wound heals up much ſooner and with more Eaſe than in the common method.

A ſecond Method.

IV. There is ſtill a third method, which ſeems to be preferable to either of the preceeding, which conſiſts in perforating the Perinæum and Bladder in the ſame Part, but with a Trocar inſtead of a Knife, the Figure of which Inſtru-

A third Method.

ment may be ſeen in *Tab.* XXIV. *Fig.* 1. the Trocar being paſſed into the Bladder, its triangular Bodkin is then immediately extracted, while its Canula remains in the Wound, and gives a freer Paſſage to the Urine in the Bladder; which Operation is not only more eaſy and expeditious, but the Wound itſelf will alſo heal much ſooner, and with leſs Trouble to the Patient. Nor is it improper in this Caſe to paſs one or two of the Fingers into the Patient's Anus, as is uſual in cutting for the Stone; by which means the Inſtrument may be more exactly directed into the Bladder, without doing any Injury to the Rectum. GARENGEOT affirms, that no body has wrote any thing concerning this Method; whereas it was propoſed by RIOLAN in a Suppreſſion of Urine, to perforate the Bladder when the Urine could not be extracted by paſſing a Catheter; and that this Perforation might be made either in the Hypogaſtrium, or in the Perinæum, in which latter he ſays the Knife is to be thruſt in laterally till it has reached the Bladder, and made way for the Urine, by which means he has freed many Patients from the moſt imminent Danger. The ſame Puncturation was alſo propoſed by THEVENOT, to be performed with a Knife till the Urine followed; beſides which it has been alſo propoſed in our own Time by DIONIS, and I myſelf had (long before GARENGEOT) publiſhed a Chapter upon the Puncture of the Perinæum, in the firſt *German* Edition of my Surgery: M. CHIRAC has alſo propoſed this method, as we are informed by MORAND, to whom we may add TOLETT, who has, in his Lithotomy, recommended a triangular Bodkin for this purpoſe, though without its Canula, of which he afterwards gives us a Figure, with which Inſtrument, he ſays, the Bladder may be commodiouſly perforated in the hypogaſtric Region; but as the Canula cannot be eaſily introduced after the Bodkin is extracted, it naturally follows, that introducing them together, the one in the other at the ſame time muſt be the beſt method.

M. DENYS's Method, and Improvements.

V. The celebrated Lithotomiſt of *Leyden* M. DENYS, has endeavoured to improve this method of diſcharging the Urine out of the Bladder. He ſays, he has obſerved that the Surgeon is very often at a Loſs to know when his Trocar is really in the Bladder, upon which Account he may thruſt it in too far, ſo as to wound the poſteriour Part of the Bladder, and endanger the Patient's Life. To avoid this Accident, he has contrived a Trocar of another kind, which is here repreſented from him in *Tab.* XXXI. *Fig.* 3, 4, 5. in the Tube, *Fig.* 3 and 4, there are three Apertures in the upper Part A A, two of which only are conſpicuous in that Poſition; there are alſo as many Apertures in its lower Part B B, which are not conſpicuous in *Fig.* 3. being concealed by the Plate C C. but in *Fig.* 5, which repreſents the Bodkin out of its Canula, we may obſerve that it is made round beyond the triangular Point; but from D D to the Beginning of its Handle E E it is triangular, conſiſting of three Sides, which are concave, which Sides of the Triangle D E ſhould correſpond with the Apertures in the Canula, when the Bodkin is thruſt into it: By this means as ſoon as the Bodkin is thruſt into the Bladder, the Urine enters through the upper Apertures A A, and flows directly through the lower ones, giving ſpeedy Intelligence of the Inſtrument's having pierced the Bladder, after which the Bodkin is extracted, and the Urine diſcharged thro' the Canula, which is left in the Wound. I remember TOLET ſays ſomething of a Trocar like this now deſcribed, the Canula of which is perforated with two Apertures. See his Lithotomy, *Chap.* XXI.

VI. Some

VI. Some Authors, as TOLET and COLOT propoſe another Method of puncturing the Perinæum, much in the manner of the *Apparatus major*, in which the Patient being rightly diſpoſed, a grooved Catheter is paſſed into the Urethra till it meets with the Obſtacle, which prevents its further Progreſs, being generally near the Neck of the Bladder, the Surgeon then makes an Inciſion in the Perinæum, cutting through the Urethra in the ſame Place, and in the ſame manner, as in the *Apparatus major*, till the Point of his Knife has arrived into the Groove of his Catheter; but then he does not inlarge his Inciſion ſo much, as when he cuts for the Stone, and by this means he does as it were convert the Urethra of the male into a female one; which done, he paſſes a Conductor or Gorgeret thro' the now-ſhort Urethra and Neck of the Bladder into its Cavity, into which he has no ſooner arrived, than the Urine makes a ſpeedy Exit, demonſtrating at the ſame time, that the Inſtrument is in the Bladder; the Urine being thus diſcharged, a Silver Tube is conveyed through the Conductor into the Neck of the Bladder, where it is fixed, and ſecured by a Bandage, as before. Both the Authors now mentioned affirm, that by dividing the Urethra ſo near the Neck of the Bladder, a plentiful Hæmorrhage follows, which abates the Inflammation and Tumor in the Sphincter and Neck of the Bladder to ſuch a Degree, that not only a Catheter, but a Canula or Gorgeret may be alſo paſſed into the Bladder, and COLOT reckons up a great Number of Patients, upon which he has performed this Operation for Ulcers and Excreſcences in the Bladder, as well as for a Suppreſſion of the Urine. However, I muſt needs think the Methods propoſed at §. III. and IV. of this Chapter, to be more ſafe and eaſy, both for the Patient and Surgeon, becauſe the paſſing of Inſtruments thro' the contracted Neck of the Bladder muſt, in my Opinion, greatly increaſe the Pain and Symptoms of the Diſorder, which may be avoided by making a Paracenteſis in that manner with a Trocar in the Bladder itſelf.

A Method agreable to the *Apparatus major*.

VII. Laſtly, There is ſtill another and moſt ready Method of performing this Operation according to the high Operation; in which the Trocar is paſſed into the anteriour Part of the Bladder, immediately above the Juncture of the *Oſſa pubis*, where the Inciſion is made for the Stone in the high Operation. Here the Bodkin being extracted, and the Urine diſcharged by the Canula, the latter is to be ſecured in the Wound by a Bandage faſtened round the Body, that the Urine may be retained or diſcharged at Pleaſure, till the Cauſe of the Suppreſſion be removed, after which the Wound may be healed by the *Balſ. Capiv.* covered with Lint and a Plaſter. Though this Operation is but ſeldom performed by Surgeons in a Suppreſſion of the Urine, I muſt needs declare it my Opinion, to be very neceſſary and convenient when nothing extraordinary forbids, ſince it is alſo recommended by ROSSETUS, RIOLAN, and TOLET; and ſince it appears from anatomical Experiments, that the Bladder may be thus ſafely perforated, when diſtended with Wind or Water, without incurring any dangerous Symptoms; and accordingly we find it has been put in Practice to good purpoſe by TURBIER, MERI, DOUGLAS, and MIDDLETON; which two laſt recommend this Method of perforating the Bladder, to be more ſafe and eaſy than that in the Perinæum.

A fouth Method agreable to the high Operation.

VIII. When the Cauſe of the Diſorder cannot be removed, in a Perſon advanced in Years, and when it proceeds from a Callus formed from ſome Fiſtu-

What is to be done after the Operation.

la in the Urethra, a Scirrhus of the proſtate, a large Stone, a Palſy of the Bladder, or ſome other obſtinate Malady; in ſuch Caſes the Patient ſhould conſtantly keep a Silver-pipe in his Bladder as long as he lives, made with a Valve and Screw, to open and ſhut, that his Urine may not come away inceſſantly, but when the Patient deſires it. But when the Cauſe is only a ſmall Caruncle or Cicatrix in the Urethra, then the Surgeon ſhould endeavour to remove the Obſtacle after his Operation by the means intimated before in *Chap.* CXXXVIII. after which, when the Paſſage is cleared, the Wound may be healed up as we directed in Lithotomy. If the Suppreſſion proceeds from any Fungus, or foul Matter in the Bladder, they may frequently be removed by ſuppurating and deterging Injections[a]; but in ſuch a Caſe it is moſt adviſeable to perforate the Bladder, rather in its lower than upper Part. Laſtly, if a violent Inflammation has poſſeſſed the Neck of the Bladder, ſo as to obſtruct the natural Paſſage of the Urine, it will then be neceſſary to bleed the Patient after the Operation, and then to adminiſter proper Glyſters and Cataplaſms, with cooling Medicines internally, in order to diſperſe the Inflammation and Tumor, wthich, if it be not effected before the third Day, the Patient ſeldom obtains a Cure.

Some Obſervations.

IX. A Suppreſſion of Urine is ſometimes accompanied with a violent Inflammation of the Scrotum, which frequently turns to a large Abſceſs, or an incipient Mortification, of which COLOT has ſeveral remarkable Obſervations in *pag.* 236, 240, & *ſeq.* In which Caſes that Lithotomiſt adviſes firſt, a Diſcharge of the Urine by puncturing the Perinæum, and then to lay open the Scrotum down to the Teſticles, that no Blood or putrid matter may be retained there, after which the injured Parts are to be treated with Balſamics, and Medicines proper in the like Caſes. During the Cure he retains a Silver Canula in the Patient's Urethra, to prevent any Urine from eſcaping into the injured Parts, which might greatly increaſe the Diſorder. In Caſes where the whole Urethra is become callous and contracted, ſo as to deny any Admittance to a Catheter, he then makes an Inciſion through the Perinæum into the Urethra, and paſſes his Probe through the Neck of the Bladder into its Cavity, and the Urine being diſcharged, he lacerates the Callus, forms a large Suppuration, ſeparates the Callus, and reſtores the Parts to their former Diſpoſition (*pag.* 241, 245.) and if a Fiſtula ſhould remain behind *in perinæo*, as ſometimes happens, he then removes its Calloſity by the actual Cautery. But after all, if this method of Cure is not proſecuted in Time, but the Patient is much exhauſted, there is generally no great Proſpect of Succeſs; but all Endeavours prove of no Effect, as M. COLOT evinces by weighty Obſervations, *pag.* 350, & *ſeq.*

[a] COLOT enumerates many Inſtances of Cures in this way, *pag.* 235, 273, 277. See alſo TOLET on Excreſcences of the Bladder in his Lithotomy, *pag.* 206.

CHAP.

CHAP. CXLV.

Of FISTULÆ *in* PERINÆO.

I. THESE Fiſtulæ are uſually the Conſequence of Lithotomy, or making a Puncture in the Perinæum and Bladder, or they may proceed from Abſceſſes in the Perinæum near the Urethra, as I have lately obſerved, or from a Scirrhoſity of the proſtate Gland, or even when the Patient is of an ill Habit, from a Wound or Ulcer, which can by no means be healed up; but its Lips becoming callous, forms a Fiſtula, through which the Urine is ſometimes preternaturally diſcharged, to the great Uneaſineſs of the Patient, being by the *Greeks* called ἐρροναδὰ, *Celſ. Lib. VII. Cap.* 26. *N.* 2. Sometimes theſe Fiſtulæ are formed from critical Abſceſſes in the Perinæum after malignant Diſeaſes, by which the *Membrana adipoſa* under the Skin, and about the Rectum, is ſometimes totally ſuppurated, the Urethra remaining entire: But theſe are not properly urinous Fiſtulæ, and they may be treated in the ſame manner as we have before directed for Fiſtulæ in general. Thoſe Fiſtulæ which diſcharge Urine, are very often occaſioned by the Uſe of Tents or Pipes, which are retained longer in the divided Parts after Lithotomy, than is requiſite, or they may alſo proceed from a Stone which is very large and rough ſurfaced, in the Extraction of which the Parts are violently diſtended, contuſed, or lacerated; or, laſtly, from a Stone lodged in the Urethra, which by obſtructing and compreſſing the Parts in contact, cauſes a Suppuration and an Ulcer, eſpecially if the Patient is of an ill Habit. The Nature of theſe Fiſtulæ.

II. The Treatment of theſe Fiſtulæ is various, according to the Patient's Habit, and the particular Diſpoſition of the Parts affected; for when the Fiſtula is very large, and has conſumed a great Part of the Urethra, the Patient being at the ſame time of a bad Habit, it is with great Difficulty, if at all, that a Cure can be obtained; and the more difficult, as the Fiſtula is of a longer ſtanding, and more callous. On the contrary, when the Fiſtula is ſmall, with little or no Calloſity, the Patient being young, and of a good Habit, a Cure may then be obtained both with Eaſe and Expedition; but if the Diſorder is accompanied with a Scirrhoſity of the proſtate Gland, it never yields to a Cure, till that Scirrhoſity is firſt removed, which is generally a very difficult Taſk, as we learn by Experience. Prognoſis.

III. There are three Methods of treating theſe Fiſtulæ: In the firſt Place, the Pipe, or Tent, or whatever elſe is contained in the Fiſtula, ſhould be immediately removed, and the Patient placed upon his Bed, or a Chair, in the ſame manner as for Lithotomy, after which the callous Lips of the Fiſtula ſhould be cut off, and the Parts brought together by a ſticking Plaſter, after they have been dreſſed with ſome vulnerary Balſam, over the Plaſter ſhould be laid a narrow Compreſs on each Side of the Wound, and the whole retained by a ſtrict Bandage; which done, the Patient's Knees are to be tied together, and ſtrict Orders given to him to lie ſtill in Bed, that the Lips of the Wound may more eaſily unite with each other. For the firſt few Days after the Operation the Patient ſhould be allowed very little Drink, that he may not be often excited Treatment.

cited to make water, and the Dreſſings ſhould not be removed till the ſecond or third Day after the Operation, or till the Patient can contain his Urine: When the Wound is by this means in ſome meaſure cloſed, the Patient may then be kept under the ſame Regimen with thoſe who have been cut for the Stone; and if he be a young Man, he may be allowed to walk about a little, by which means, if the Fiſtula is not very malignant, the Patient may obtain a perfect Cure. The ſecond method of treating theſe Fiſtulæ is, by removing their Calloſity with Cauſtics; and the Eſchar which they produce may be digeſted off with Baſilicon, or ſome other digeſtive Ointment, after which the Wound may be cloſed with ſome ſticking Plaſter, and proper Bandage, as before directed. As for the particular Cauſtic to be uſed in theſe Caſes, the moſt commendable are *Troch. de Min.* and *Lap. Infern.* or *Mercur. præcip. alb.* mixed with *Liniment. Arcæi*; or, laſtly, a piece of Bliſter-plaſter may be applied to the ſame purpoſe, according to the method of M. CHESELDEN, as we are told by DOUGLAS in the *Appendix* to his Hiſtory of the lateral Operation, *pag.* 19.

Further Treatment.

IV. It is to be obſerved, that the Cure of theſe Fiſtulæ in the Perinæum uſually comes on very ſlowly, eſpecially when they are large, and their Calloſity but imperfectly removed, either by the Knife or Cauſtic, and if the Patient at the ſame time does not obſerve a proper Diet and Reſt of Body. If from theſe, or ſuch like Cauſes, the Fiſtula ſtill continues, and renews its Calloſity, it will be neceſſary to repeat the Inciſion or Application of the Cauſtic, till the Parts appear ſound, Sometimes theſe Fiſtulæ are beſt healed by ſtitching the Lips of the Wound together while they are bleeding, after the callous Parts have been cut off, or they may be retained by Compreſſes and Bandage; and when the Parts appear to be joined, the Stitches may be then extracted, and the Dreſſing renewed. Sometimes it is neceſſary to retain a Catheter in the Urethra and Bladder, that the Urine may be diſcharged thereby during the whole Cure, otherwiſe the Urine eſcaping through the Wound, will greatly impede its Agglutination. Laſtly, if the Fiſtula of the Perinæum is too narrow to admit of this Treatment with Conveniency, it ſhould be either dilated with a Sponge, or inlarged by the Inciſion-knife. A remarkable Inſtance of one of theſe Fiſtulæ being happily cured by this Method, chiefly by Suture, I ſhall communicate in the Obſervations which I intend ſhortly to publiſh.

Palliative Cure.

V. Hitherto we have deſcribed the four Methods of treating Fiſtulæ of the Perinæum, it ſtill remains for me to take notice briefly of a fifth uſed in treating this Diſorder, which is uſually called the *palliative Method*: To this Head belongs the Inſtrument deſcribed by NUCRE and SOLINGEN, and propoſed by WINSLOW; I mean the Yoke which we have deſcribed in *Chap.* CXXXVI. for an Incontinency of Urine, that, by compreſſing the Fiſtula with this Inſtrument, the Urine may not be continually diſcharged through it; and thus the Diſorder may be in ſome meaſure mitigated, when a perfect Cure cannot be abſolutely obtained; but, to ſay the Truth, this Inſtrument is very often but of little Service to the Patient, as we learn from Experience, ſince it permits the Urine to eſcape thro' the Fiſtula.

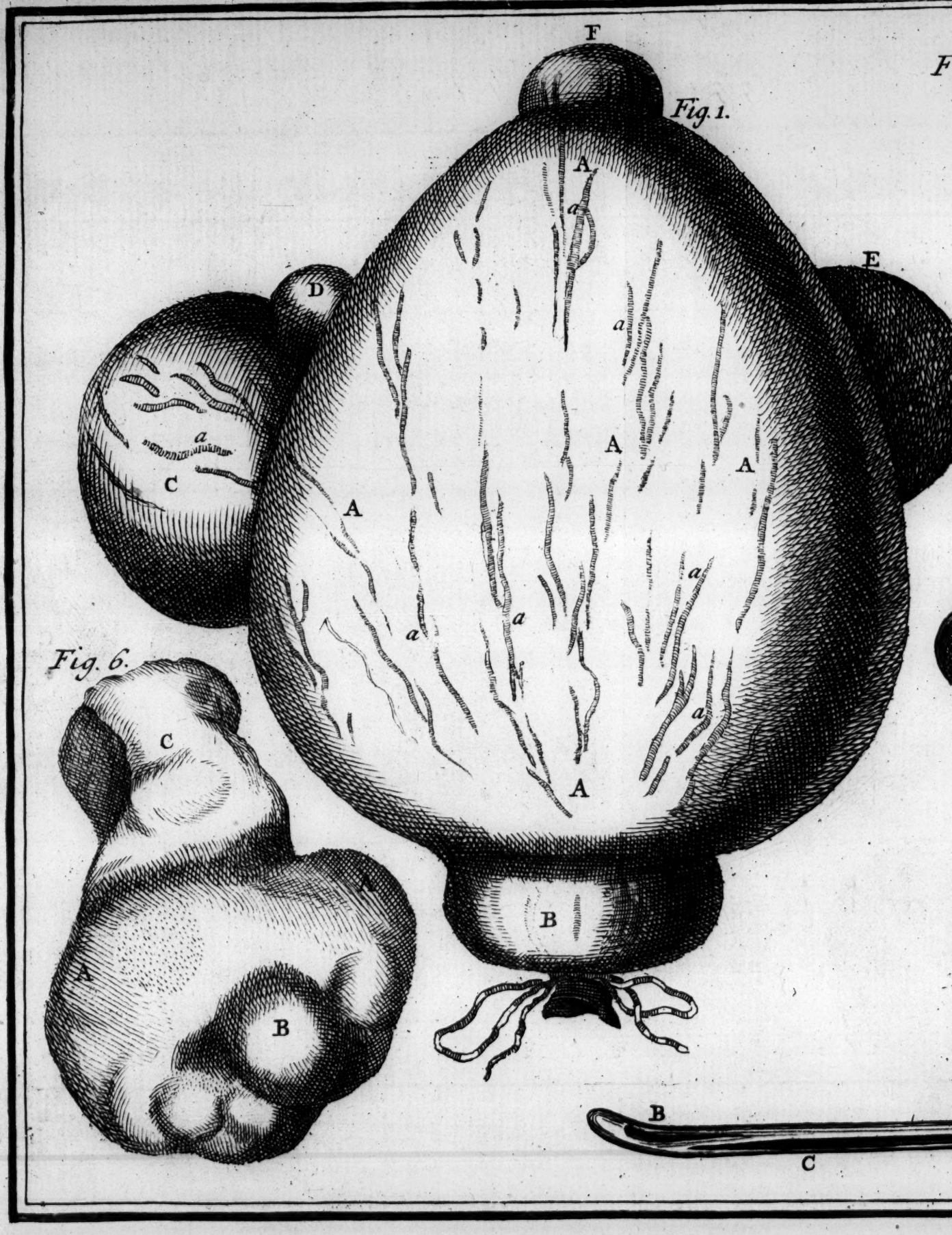
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Fig. 3.

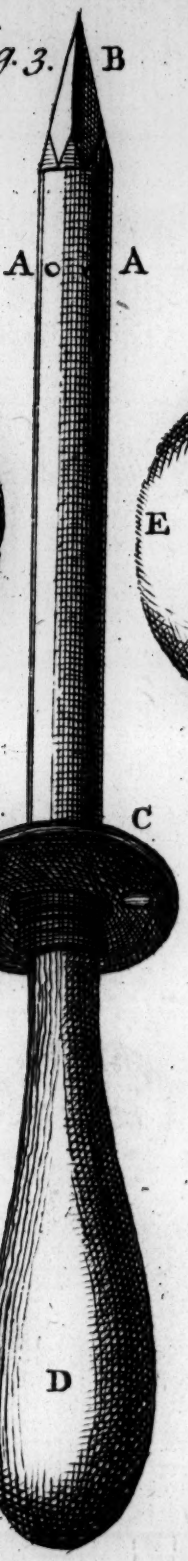
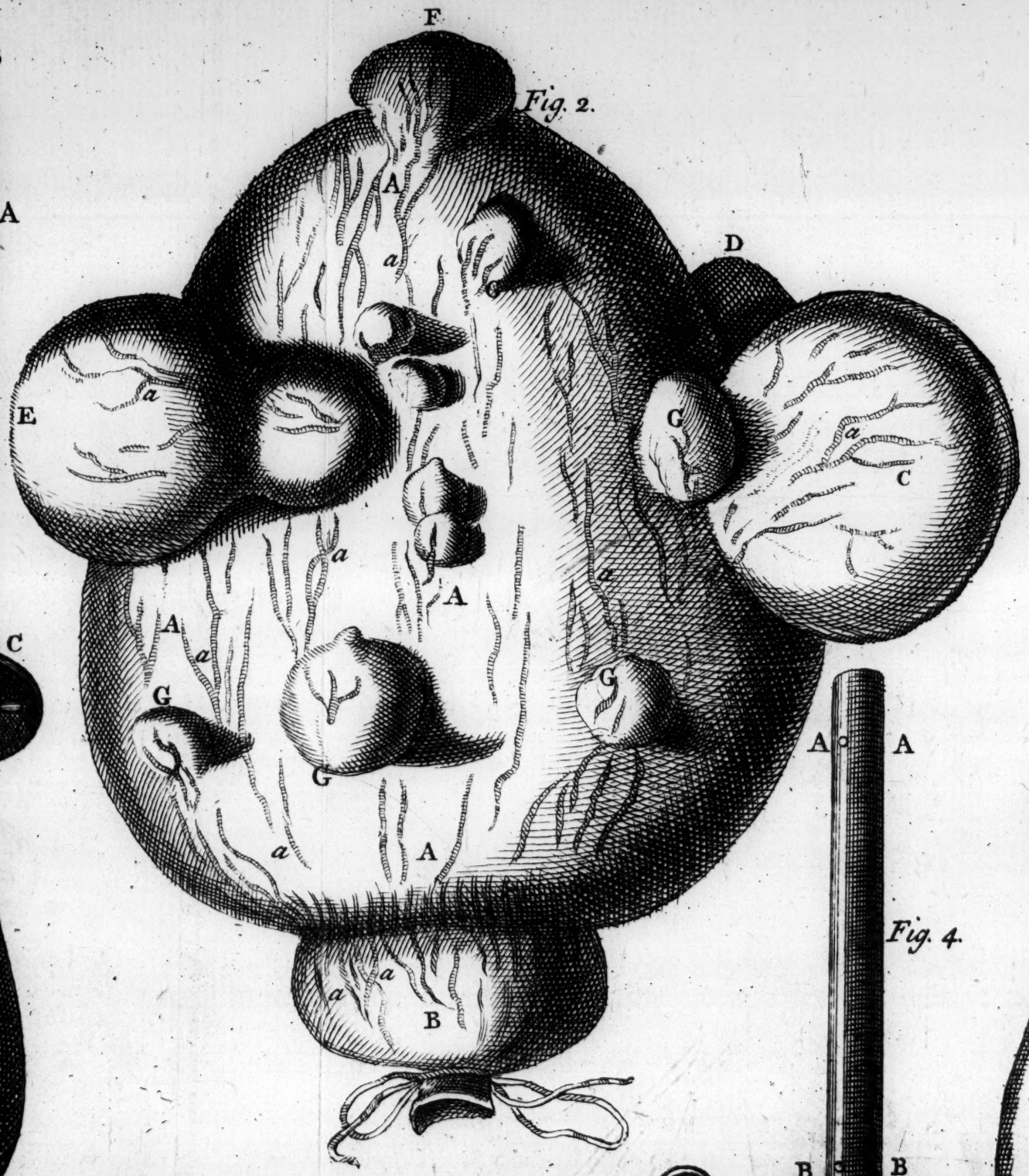


Fig. 2.



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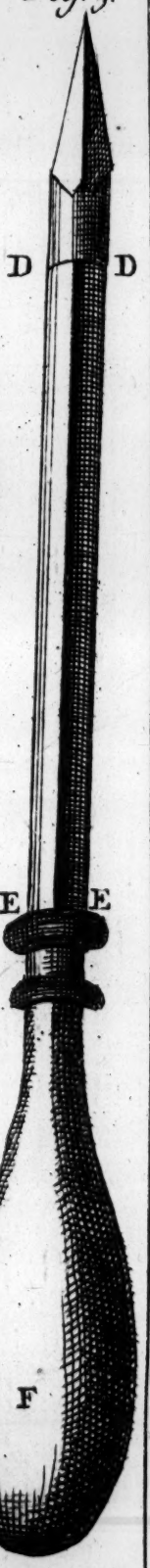

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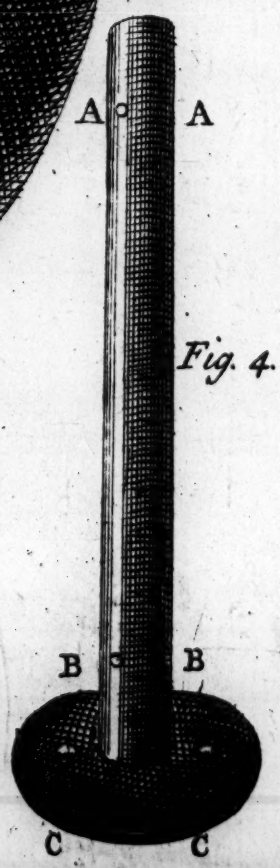
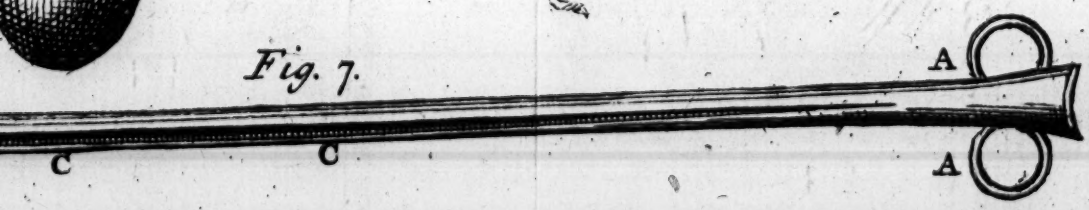


Fig. 7.



J. Mynde sc.

An EXPLANATION *of the* THIRTY-SECOND PLATE.

Fig. 1. Repreſents a human Bladder taken from a male Subject, in the anterior Part of which may be ſeen various empty Tubercles, or Cells, which are diſtended by inflating the Bladder; in which Cells the Stone lies ſometimes concealed. A A A ſhew the pyramidal Figure of the Bladder; B denotes the proſtate Gland inveſting the Neck of the Bladder, which is tied with a Thread near the Urethra. C is the hollow Cell on the right Side of the Bladder, which is larger than any of the reſt. D repreſents a leſs Cavity above the former. E ſhews a like Cavity on the left Side, another of which is at the Fundus of the Bladder marked F. *a a a* denote the Blood-veſſels which are diſtributed upon the Bladder.

Fig. 2. Repreſents a poſterior View of the ſame Bladder, being explicable by the ſame Letters; to which add G G G G Cells which are ſtill ſmaller, and not to be diſcerned on its anterior Part.

Fig. 3. Exhibits the Trocar of M. DENIS in its Silver Canula, which differs from the common in its having three Apertures at the End of the Canula, two of which only are viſible at A A, thro' which Apertures the Urine paſſes into its Cavity. B the triangular Point. C C the Plate of the Canula perforated with two Openings. D the Handle of the Inſtrument.

Fig. 4. Repreſents the Canula of the Trocar alone, in which A A denote the Apertures at the End of the Canula in the preceeding Figure. B B repreſent other correſponding Apertures through which the Urine flows after it has enter'd by the preceeding; which Apertures are not to be ſeen in *Fig.* 3. being obſcured by the Plate C C.

Fig. 5. Exhibits the Bodkin out of its Canula D D, the Part of its Body immediately below the Point, which is made cylindrical to fit the Canula; but the Part between D D and its Handle E E is triangular, and made a little concave on each Side, ſo as to give a Paſſage to the Urine: F its Handle. See more of this Inſtrument in *Chap.* CXLIV. §. 5.

Fig. 6. Repreſents a Stone of an uncommon Size and Figure, which I extracted without much Difficulty by the high Operation, it weighed about ℥ 5. and the Reaſon of my repreſenting it in this Place is for the Conviction of thoſe who deny, that large Stones can be extracted by the high Operation. A A the Baſis of the Stone which lay near the Neck of the Bladder. B a ſmall Eminence of it which ſtuck in the Neck of the Urethra. C the upper Part which lay next the Fundus of the Bladder.

Fig. 7. Repreſents the Silver Catheter, which is ſtrait and hollow for Women, being of a particular Make different from that which we before exhibited in *Tab* XXVII. *Fig.* 1. A A are two Rings near its Handle. B an Aperture in its Side near its Extremity, which is to be paſſed into the Bladder, oppoſite to which there is another ſimilar Opening. C C C a Groove in the convex Part of the Catheter ſerving for various Uſes, and particularly for conducting the male Conductor into the Bladder, and for guiding the Knife when the Neck of the Bladder is to be divided as in other grooved Catheters.

CHAP.

CHAP. CXLVI.

The Method of dividing præternatural Cohæſions in the genital Parts of Women.

Kinds of the Diſorder.

I. WE ſometimes meet with Girls, who have no Paſſage for the Diſcharge of their Urine, by reaſon of the Parts growing together whilſt they were in the Womb, which generally ſhews itſelf by the Infant's crying perpetually, without diſcharging any Urine for ſeveral Days after the Birth; in which Caſe the Infant muſt periſh if ſpeedy Relief be not had by the Knife; for it is impoſſible for the Infant to live without diſcharging its Urine. In others again we find the Urethra ſo ſmall, or the adjacent Parts ſo ſtrictly united, that the Urine cannot be diſcharged but by Drops [a], and that with the greateſt Difficulty; ſometimes the Mouth of the *Vagina*, or *Uterus*, is quite cloſed by the Membrane called *Hymen*; ſo that when they come to the Age of Puberty, their *Menſes* can have no Paſſage, nor the Huſband any Entrance, in conſequence of which follow violent Pains and Tumours in the Abdomen, with Frenzy and other bad Symptoms; which has occaſioned this Diſorder to be obſerved by ſeveral prudent Phyſicians [b], who have denominated thoſe who are thus affected *Atritæ*, or imperforated: *Ariſtotle* [c] appears to have been acquainted with this Diſorder, when he writes, that the "*Os Uteri* of ſome Women being cloſed or "grown together, when they come of Age, their *Menſes* finding no Paſſage, "excites Pain ſo as to occaſion a Rupture of the Parts by Nature, or a Diviſion "them by the Hand of the Surgeon; ſome of theſe die when the *Hymen* is either "opened by Violence, or remains impervious." We again meet with ſome Girls, who have the Mouth of their *Vagina* ſhut with a Membrane, which has a ſmall Aperture, through which the *Menſes* find a Paſſage [d], but no Entrance is afforded for the Huſband; which Diſorder ſeldom makes itſelf known till Marriage.

Difference of the Diſorder.

II. This Diſorder differs in different Patients; for in ſome there is the Remains of an urinary Paſſage, which alſo leads to the *Vagina* and *Uterus*; in others the *Vagina* is ſo grown together, that there is not the leaſt Appearance of any Paſſage. In others, again, the Urine is returned in the *Vagina*, where it is accumulated, and breaks forth immediately after the Birth, and in ſome Adults, who have no free Paſſage for the Urine, the menſtruous Blood greatly diſtends the *Labia pudendi*, by which means there is a Paſſage ſhown both to the Urethra and Vagina. Sometimes this Diſorder happens in the Mother's Womb, and is

[a] Such a Caſe is deſcribed by ROONHUYS *Lib. II. de Clauſura Uteri*, Obſ. 1. p. 114. Edit. *Amſtel.*

[b] Among whom are BENIVENIUS *Lib. de Abdit. Morbor. Cauſſ.* cap. 28. CABROLIUS *Obſerv. Anatom.* 23. FABRICIUS AB AQUAPENDENTE *in Oper. Chirurg.* Cap. *de Hymene imperforato.* HILDANUS *Cent. III. Ob.* 60. SCHENCKIUS *Lib. IV. de Part. Genit.* SOLINGEN *in Obſ. V.* ROONHUYS *Obſ.* pag. 124. MEEKYEN *Obſ. Chirurg.* 55 MAURICEAU *in Obſ. de Morb. Gravid.* 231, 495. RUYSCH *Obſ. Chirurg.* 32. SAVIARD *Obſ. Chir. IV.*

[c] *De Generatione Animal.* Lib. IV. Cap. IV.

[d] An Inſtance of this kind we have given us by HILDANUS in *Cen. III. Ob.* 60.

therefore connate, as ARISTOTLE and CELSUS have obſerved: But it very often proceeds in Adults from an Exulceration in the Mouth of the Vagina, eſpecially after a difficult Birth, when the Parts are lacerated, violently inflamed or ulcerated ſo as to make them grow together, leaving only a ſmall Aperture for the menſtruous Blood to diſcharge itſelf, but not ſufficient to give any Admittance to the Male[e]; ſo that in new-born Infants this Diſorder ſometimes obſtructs the Diſcharge of the Urine, and in Adults it intercepts (1.) the menſtruous Flux, (2.) Coition, and conſequently Conception and Birth.

III. Theſe Diſorders are diſcovered in new-born Infants by their diſcharging no Urine for ſeveral Days after the Birth, as alſo by the Sight and Touch[f]; but in Adults, where the Vagina is totally cloſed by a Membrane, the Diſorder diſcovers itſelf by violent Pains in the Loins, a Suppreſſion of the Menſes, Pain and Tumour of the Abdomen, Paleneſs in the Countenance, *&c.* but, above all, the Sight and Touch afford the ſureſt Indications. But in thoſe who have a ſmall Perforation in the Hymen, the Diſorder ſhews itſelf, not ſo much by obſtructing the Menſes, as the conjugal Intercourſe of the Huſband. With regard to the *Prognoſis* of this Diſorder, if the Membrane, which occludes the Mouth of the Vagina, is thin, and only a Continuation of the Hymen, it is generally broke open at the firſt conjugal Intercourſe; and if that has not the deſired Effect, a Paſſage may be eaſily made by an Inciſion-knife, with the Help of an expert Surgeon; yet when the Coheſion of the Parts is very ſtrong and deep, the Cure muſt then be attended with ſome Difficulty, as the Thickneſs of the fleſhy Subſtance may make the Surgeon liable to wound the adjacent Rectum; which Accident RHOONHUSE ingenuouſly confeſſes happened to himſelf; nor is the Cure difficult upon that Account only, but alſo afterwards, from the great Stricture of the Parts, it will be equally difficult to dilate and keep them open, ſo as to recover their natural Dimenſions.

Diagnoſis and prognoſis.

IV. In order to treat this Diſorder with Judgment and Succeſs, it is neceſſary for the Surgeon, firſt to have diligently conſidered its Nature and Diſpoſition, if there remains any Mark of the urinary Paſſage, and of the Entrance into the Vagina and Uterus, the Obſtruction being formed only by a thin Membrane, which ſhuts the Urethra, Vagina, or both, that may be commodiouſly divided by a crucil Inciſion in the Form of the Letter *X*, as CELSUS adviſes; but if there remains a ſmall Aperture either in its upper or lower Part, it may be then divided with a Pair of Sciſſars, or with a Director and crooked Scalpel, being careful to avoid injuring the Urethra and Bladder, and, if it be thought proper, the whole Membrane may be in this manner cut out, after which a Tent is to be ſpread with ſome digeſtive Ointment, and retained in the Part for a few Days by a proper Bandage, then another Tent may be ſpread with a deſiccative Ointment; ſuch as *de Ceruſſ.* or *Diapomphol.* and applied as before, 'till there is no Danger of another Coheſion in the Parts. But if the

Obſtruction from a Membrane.

[e] Inſtances may be ſeen in the fore-cited Authors, and in PLATERI *Prax. Medic. Part.* I. *Lib.* II. *Cap.* 17. BAUHINI *Anat. Lib.* I. *Cap.* 49. FORESTI *Obſ. Lib.* XXVIII. *Obſ.* 55. BOEKER *in Pædioctonia inculpat.* pag. 35, *& ſeq.* Where he obſerves this Diſorder to have ariſen from an Ulceration after the Small-pox. K. NOELET Obſ. Curieuſes, *Obſ.* 13. *pag.* 46.

[f] I had once the Care of a Maid, who had all the mentioned Symptoms, and Marks of a ſtrict Coheſion of the Vagina near the Uterus; but by the Sight and Touch I could not find any Appearance thereof in fact.

Vagina is cloſed by a very thick and fleſhy Membrane, or an Excreſcence ſo as totally to efface the Paſſage which leads to the Uterus, the Surgeon ſhould in that Caſe try to find a Paſſage with his Finger at the Bottom of it; which done, the Part is to be marked, and the Excreſcence removed by the Scalpel, as we before directed; only towards the latter End, when it is near being healed, a leaden Pipe, anointed with a cicatriſing Medicine, ſhould be introduced and retained in the Part till the Cure is compleated.

Obſtruction from a Stricture.

V. Sometimes the Paſſage of the Vagina to the Uterus is ſo contracted in new-married Women [g], either from an Ulcer, or other Accident, that the Huſband can find no Entrance, tho' the Menſes have at the ſame time a pretty free Diſcharge; in which Caſe it may be adviſeable to make many ſmall Inciſions all round the Sides of the contracted Part, and then to make a Dilatation with a large Tent, as I did with Succeſs upon the Wife of a certain Taylor. After the Operation, it will be proper to renew the Dreſſings twice every Day, except the firſt, to prevent the retained Matter from injuring the Parts, which may be gradually diſtended with Peſſaries made of Sponge prepared, or of dried Roots cut in a proper Shape; and, laſtly, a leaden Pipe, ſpread with ſome deſiccative Ointment, may be introduced and retained in the Part till the Cure is compleated, as before. When the Orifice of the Vagina is not contracted from the Birth, but proceeds from ſome external Cauſe, it may be treated with Succeſs by the Method which we have now deſcribed, as I experienced upon the Wife of a Muſician. A Caſe of this kind may be ſeen in SAVIARD's *Obſ. Chirurg.* 32.

Of a particular Caſe.

VI. We have a very remarkable Example in CABROLIUS, of a Patient who was imperforated in this manner at the Age of eighteen or twenty, her Urethra being alſo obſtructed by a thick Membrane, ſo that ſhe diſcharged all her Urine at the Navel, probably through the Urachus, which hung out like the Comb of an *Indian* Cock, for about four Fingers Breadth, affording an intolerable Smell of putrid Urine. To cure this Diſorder CABROLIUS firſt divided the thick Membrane to make way for the Urine, paſſing a leaden Pipe through his Inciſion down to the Bladder. The Day after, he proceeded to the Cure of the diſeaſed Navel, by making a ſtrong Ligature with waxed Thread upon the pendulous Part through which the Urine was diſcharged; then he cut off the Part below the Ligature, as in the Operation for Ruptures, cauterizing the Part with a hot Iron, and after the Eſchar was removed, made a Cicatrization as in other Ulcers; and this he did in the ſpace of twelve Days, in which he made a perfect Cure of the Girl. And therefore the ſame Practice may be uſed when the like Caſe offers, omitting the Cauterization, as being too ſevere and terrifying to the Patient, and not neceſſary in the Operation.

[g] HILDANUS *Obſ.* 60, *& ſeq.* Cent. III. SAVIARD *Obſ.* 32.
[h] *In Obſervat. Anatom.* XX.

CHAP.

CHAP. CXLVII.

The Method of opening the Vagina *when obſtructed near the Womb.*

Nature of the Diſorder.

I. BESIDES the forementioned Diſorders which obſtruct the Urethra, or Entrance of the Vagina, we ſometimes meet with Caſes, in which the Sides of the Vagina cohere, or its Cavity is obſtructed near the Womb by ſome Membrane, which not only denies a Paſſage to the Menſes, but alſo occaſions an Accumulation of them, ſo as to cauſe acute Pains and Tumour in the lower Region of the Abdomen, together with Nauſea, a waſting of the Habit, Reſtleſſneſs, and the other bad Symptoms which uſually precede Madneſs. Sometimes this Diſorder is born with the Patient, and ſometimes it is occaſioned afterwards by external Cauſes, and eſpecially a Laceration, Inflammation, or Ulceration [a] of the Vagina, frequently occaſioned in difficult Births, ſometimes the Obſtruction is near the Mouth of the Vagina, and ſometimes near the Uterus, or betwixt both; ſometimes, again, the whole Vagina, or greateſt Part of it is in this manner cloſed and obſtructed, or filled with a fleſhy Subſtance, which is a very dangerous Caſe to undertake, becauſe the Bladder or Rectum may eaſily be injured in the Operation. And though, in ſome of theſe Caſes, there remains a Paſſage ſufficient to diſcharge the Menſes, yet they are incapable of the conjugal Offices, which has ſometimes induced the married Couple to believe themſelves bewitched, or to ſeek for a Divorce, when at the ſame time the Diſorder may be remedied by Art, and though a free Admittance is denied, ſome of them have been impregnated [b]. We have a merry Relation of a Girl that was imperforated after this manner, who, when ſhe became ſenſible that ſhe could not be debauched by any one, enliſted a great many to her Service, particularly ſome ſtout Soldiers, who, upon Trial, were all diſappointed in their Expectations, bilked of their Money, and derided by the Girl, who continued as much a Maid as ever. Some time afterwards this Girl committed herſelf to the Care of a Surgeon, in order to be freed from the Impediment; the Cure ſucceeded ſo well, that, in a little time afterwards, he got her with Child, and ſhe brought him Twins into the World, as a Teſtimony of his Skill, and a Reward for his Trouble.

Method of Cure.

II. With regard to the Cure of this Diſorder, it generally ſucceeds without much Difficulty in young Girls, where the Membrane is thin, and not far from the Orifice of the Vagina, ſo that it may be commodiouſly inciſed; but in Adults that Operation is hardly practicable, unleſs when the Membrane is diſtended outward by the menſtruous Blood; in which Caſe the Inciſion has been performed by BENIVENIUS, CABROLIUS, FABRICIUS AB AQUAPEND. ROOHNHUSIUS, SOLINGEN, MEEKREN, RUYSCH, (*Obſ.* 32.) NABOTH, (*Diſſert.*

[a] Thus BENIVENIUS has obſerved this Diſorder from the ſame Cauſe in the Venereal Diſeaſe, *Lib. de abditis Morbor. cauſis*, cap. 31. and BECKERUS from the Small-pox.

[b] V. SOLINGEN Obſ. de Mulier. Morb. 34. ROONHUYS lib. cit. *pag.* 127. & 130. MAURICEAU Obſ. 489. RUYSCH Obſ. 22. BOHNIUS in Circ. Anat. Progymn. I. COWPER in Phil. Tranſact. N°. 237. *pag.* 56.

de Sterilit. §. 4.) AMYAND[c], and others, who relate, that after the Inciſion followed a Diſcharge of thick Blood, and a fetid Liquor, by which means the Patient has been relieved from the moſt preſſing Symptoms and imminent Death. In theſe Caſes the Cure has been compleated by dilating the Parts after Inciſion with proper Tents and Peſſaries of wax, adding towards the latter End a leaden Pipe, in order to induce a Cicatrization of the Parts. But when the Vagina is obſtructed by a very thick Membrane, or very near the Mouth of the Uterus, the Caſe is then much more difficult, but to be performed in the ſame manner as before, though with a little more Caution, to avoid injuring the Rectum and Bladder. In this Diſorder it may be ſometimes neceſſary to uſe the *Speculum Uteri*, repreſented in *Tab.* XXXIV. *Fig.* 15. by which means the Parts and their Diſpoſition may be more exactly diſcerned, and the Inciſion more eaſily performed.

How managed in Women with Child.

III. If Women with Child, or near their Delivery, are thus afflicted, the Operation ſhould be timely performed, leſt it occaſion a very difficult and dangerous Labour. The ſooner the Inciſion is made before the Time of Delivery the better, otherwiſe when the Fœtus is large, there will be ſome Danger of wounding it; but when it is through Negligence or Ignorance deferred, till the Time of Birth is at hand, it is even then better to perform the Operation, than to neglect it, being careful not to wound the Fœtus. It is therefore adviſeable to make at firſt but a ſmall Inciſion in the Membrane ſufficient to inſert the obtuſe pointed Knife, *Tab.* V. *Fig.* 4 & 5. to compleat the Separation of the Membrane, which may be alſo effected by a Director and Inciſion-knife, or a Pair of Sciſſars[d]. MAURICEAU[e] directs the Midwife in this Caſe to tear the Membrane with her Fingers; but it is much ſafer to divide the Parts by Inciſion, which is not attended with thoſe bad Symptoms conſequent on a Laceration.

Some neceſſary Obſervations.

IV. It is to be here obſerved, that when the Vagina is obſtructed by a thick and fleſhy Subſtance very near the Mouth of the Uterus, the Diviſion cannot, in that Caſe, be performed without much Difficulty and Danger, ſo that it is often more adviſeable to relinquiſh, rather than undertake the Cure, as was formerly done by BENIVENIUS[f]. But even in thoſe Caſes, in which the Operation is not very dangerous, if the Parts are not kept open a conſiderable Time with proper Tents, Peſſaries, or a leaden Pipe, they generally contract again, ſo as to give the Huſband no Admiſſion; and thus I have been obliged to repeat the Operation, and ROONHUYS has done the ſame. But when the Sides of the Vagina are ſtrictly united near the Uterus, as I obſerved in the Wife of a certain Butcher, whoſe Diſorder aroſe from a Difficulty in the Birth, the Operation is then extremely dangerous, ſo that I thought it better to refrain from the Operation, though I was ſtrongly preſſed to it both by the Huſband and Wife, being deſirous of Children. In ſome Caſes, where there is a thick and fleſhy Subſtance in the Orifice of the Vagina, it frequently becomes callous, or grows up again after Extirpation, if it is not kept down by the Application of

[c] Philoſ. Tranſact. N°. 422. In which Caſe the Vagina was ſo obſtructed with Caruncles growing ſoon after Delivery, that not only the Paſſage of the Menſes was obſtructed, but alſo the Urethra compreſſed, ſo as to occaſion a Suppreſſion of Urine.

[d] After the Method of RUYSCH *Obſ.* 22. where the Caſe is illuſtrated with a Figure.

[e] Obſ. de Gravid. *pag.* 489. [f] Lib. de Abdit. Morb. Cauſis, *cap.* 31.

Cauſtics

Cauſtics and a leaden Pipe, till the Paſſage is ſufficiently large, and its Sides perfectly healed, otherwiſe the Vagina will eaſily cohere again, or become ſo much contracted as to render the Operation of no effect. For more on this Diſorder, the Reader may conſult ROONHUYS in *Lib.* II. of his *Chirurg. Obſ. de clauſis Vaginis*, as alſo BECHERUS in *Pædioctonia inculpata* §. XXVIII. *& ſeq.* ROONHUYS alſo treats of the Method of opening the internal Mouth of the Uterus when thus cloſed, *l. c. pag.* 133 *& ſeq.*

CHAP. CXLVIII.

Of the Clitoris *growing too large.*

Hermaphrodites.

I. IN ſome Women the Clitoris grows to ſo large a Size, as to equal and reſemble the Penis of the male [g], upon which Account ſuch Women have been called *Hermaphrodites*, notwithſtanding the Clitoris is without any Perforation, and does not diſcharge either Semen or Urine. As the monſtrous Size of this Part is a great Incumbrance to the conjugal Offices, the Surgeon's Aſſiſtance is therefore ſometimes deſired to remove the Impediment. This Diſorder is ſaid to have been frequent among the *Arabians* and *Egyptians*, inſomuch that it was a common Practice with them to cut off the Part, which indecently appeared externally in the new-born Infant; which, however, is an Operation ſeldom performed among the *Europeans*, becauſe Women, who have this Part larger than uſual, are deſirous of concealing it, either through Luſt, Modeſty, or a Dread of the Knife. But that the Surgeon may not be ignorant what to do in this Caſe, he ſhould obſerve that there are two Methods of proceeding; one is, by making a Ligature upon the Part, and cutting off all below it, in the ſame manner as we have before directed in removing Part of the Penis when mortified. 2*dly*, By cutting off the Part with an Inciſion-knife, and, after it has bled ſufficiently, by ſtopping the Hæmorrhage with Styptics and Bandage, performing the remainder of the Cure as in other Wounds. BALLONIUS relates, that the *Indians* remove the too great Length of this Part in their Women, by applying an actual Cautery.

CHAP. CXLIX.

The Method of treating the Nymphæ *when too much enlarged.*

THE Nymphæ in Women are ſometimes ſo large, as not only to hang without *the Labia pudendi*, but alſo to prove very troubleſome to them in walking, ſitting, and in their conjugal Embraces; and may therefore require the Surgeon's Aſſiſtance [h]. The Operator is therefore in the firſt Place to lay

[g] Inſtances of which we have in TULPIUS, DE GRAAF, PLATERUS, RHODIUS, PLAZONUS, PANAROLUS, PAULINUS, &c.

[h] See an Inſtance in SOLINGEN de Morb. Mulier. *Obſ.* 20. MAURICEAU *Obſ.* 174.

the

the Patient in a proper Poſture, and, taking hold of the Nymphæ with his left Hand, he is then to cut off ſo much of them with a Pair of Sciſſars in his right, as he ſhall judge neceſſary, taking care to have in Readineſs Styptics for the Hæmorrhage, and Medicines to prevent the Patient from fainting. When the Operation is over, the Wound may be dreſſed with ſome vulnerary Balſam, and healed without much Difficulty in the common Method. SOLINGEN gives us an Example, in which the Nymphæ were extirpated, after they had been ſeized with an incipient Mortification. *V. Obſ.* 80. *de Morb. Mulier.*

CHAP. CL.

The Method of removing Tubercles, Caruncles, and other Excreſcences in the Vagina.

Nature of the Diſorder.

I. WE ſometimes meet with Excreſcences of various Sizes and Figures, reſembling a Fig, Muſhroom, Pear or the Clapper of a Bell, infeſting both the external and internal Parts, and growing ſometimes to ſuch a Size, that they hang out like the Clapper of a Bell, and prove exceeding troubleſome both in Bed, Walking, or Sitting; they often prove the Seat of violent Pains, and ſometimes of a Mortification, or Cancer, eſpecially when they are overgrown, and not timely removed; theſe are uſually called *Sarcomata* of the *Uterus*. CELSUS[a], and TULPIUS[b] call them by the ſimple Name of *Fungus*; but SOLINGEN[c] terms them *fici*, and ſometimes *cancerous*; but they are improperly and indiſcriminately termed cancerous, ſince they eaſily yield to a Cure, which is not in the Nature of that Diſorder. The nearer they are to the Mouth of the Vagina, the more eaſy it is to remove them, which is a very difficult Taſk when they lie deep, ſo that TULPIUS terms it a very uncommon Operation for a Surgeon to cut off Tumours of this kind. Some have falſly eſteemed them to be a *Prolapſus Uteri*, without any manner of Reaſon, as I ſhall preſently demonſtrate.

Treatment.

II. Theſe Diſorders may be treated in the ſame Method before propoſed for Tubercles and fleſhy Excreſcences in general, *Chap.* XXVII. removing them either by Ligature[d], the Knife, or cauſtic Applications uſed either ſeparately or conjunctly; but Care ſhould be taken not to miſtake a *Prolapſus Uteri* for an Excreſcence of this kind. For the reſt, as Excreſcences in this Part are very difficult to be come at, like Polypuſes and Caruncles in the Noſe, it will be therefore neceſſary to make uſe of the Plyers or Forceps directed by FABRIC. AB AQUAPEND. and DIONIS, for extracting Polypuſes of the Noſe. See *Tab.* XIX. with which Inſtrument the Excreſcence may be twiſted off. But before this Method be undertaken, it ought to be conſidered, whether the Patient can undergo the Operation, without being expoſed by it to greater Injuries. VOL-

[a] Lib. VI. Cap. 18. N. 11.
[b] Obſ. Med. Lib. III. Cap. 33 & 34.
[c] Obſ. de Morb. Mulier. 29 & 56.
[d] An Example may be ſeen in MEEKREN, *Obſ. Chirurg.* Cap. 51. with a Figure of it. Sarcomas of the Uterus have been alſo lately removed by VATERUS, as he tells us in a Diſſertation on the Subject, by making a Ligature round the Root of the Tumour, and then extirpating it with the Knife, as I have alſo done myſelf.

TERUS, a *German* Surgeon, tells us that he has with Succeſs extirpated many of theſe Excreſcences in the genital Parts of Women by a red-hot Inciſion-knife; which is a Practice in my Opinion rather to be abhorred than encouraged. SOLINGEN relates, that he happily extirpated a cancerous Excreſcence in the Vagina of a Woman, who recovered in a ſhort Time; but he does not tell us by what means he peformed this Cure, nor does he inſtance the Reaſons which he had for calling it cancerous [e].

CHAP. CLI.

The Method of extracting the Stone in the Bladder of Women.

Women leſs ſubject to the Stone than Men.

I. WOMEN are not ſo often neceſſitated to undergo the Operation for the Stone as Men, becauſe they are not ſo ſubject to the Cauſes which produce it; for, in the firſt Place, they are more regular in their Diet, and then their urinary Paſſages are more lax, ſhort, and open; by which means the ſmall Stones, which are formed in their Kidneys, Ureters, and Bladder, are generally diſcharged before they are much increaſed, along with the Urine in its Paſſage through their ſhort and diſtractile Urethra, and even when they have been retained and enlarged in the Bladder for a conſiderable time, their Urethra ſo eaſily dilates, that we are furniſhed with many Inſtances of pretty large Stones, making their Eſcape without any Aſſiſtance from the Surgeon. Thus I had a Stone brought me weighing two Ounces, in Figure and Size like a ſmall Hen's Egg, but a little flatter [a], which was diſcharged from a Country-woman in the Neighbourhood, after ſhe had ſuffered the moſt excruciating Pains, like thoſe of Labour. Upon this Account it is a common Obſervation, that fifty of the male Sex are uſually cut for the Stone to one of the female; and MOLINEAU even reckons, that there is not above one Woman to be found among a hundred calculous Patients, which have undergone the Operation at *Paris*.

Extraction often neceſſary.

II. But notwithſtanding Women have naturally this Advantage of diſcharging ſmall Stones more eaſily than Men, yet they ſometimes ſtand in need of the

[e] Vid. KERKRING. Spicileg. Anat. Obſ. 53. MEEKREN Obſ. Cap. 54. SOLINGEN Obſ. 29. N. 50. RUYSCH Obſ. 6. CELSUS Lib. VII. Cap. 30. N. 11.

[a] The Writers of Obſervations furniſh us with many remarkable Hiſtories of this Nature, and particularly BORELLI (Cent. II. Obſ. 22) gives an Account of a Stone coming ſpontaneouſly from a Woman, which was as large as a Gooſe-egg. KERKRINGIUS (*Spicel. Anat. Obſ.* 67. *pag.* 163.) has obſerved one of above three Ounces Weight; and BARTHOLIN deſcribes a Stone thus diſcharged as big as a Hen's Egg, in *Hiſt. Anat. Cent.* I. *Hiſt.* 71. —— *In Miſcell. Nat. Cur. Dec.* I. *Ann.* VI, VII. *Obſ.* 7. we have an Account of a Stone thus diſcharged, weighing an Ounce and an half; and we have afterwards an Account of two other Stones weighing each two Ounces and an half, *Dec. ejuſd. An.* VIII. *Obſ.* 11. *pag.* 20. & *Dec.* II. *An.* II. *Obſ.* 180. and in *Dec.* III. we have more Inſtances; as we alſo have in DE GRAAF *de Mulier. Organ.* and in the *Philoſ. Tranſactions*. But more particularly remarkable are thoſe Stones, which were voided in great Numbers for a long time running by a Woman of *Wolfenbuttle*; a Deſcription of which we have from D. HIERONYMUS, in a particular Diſſertation publiſhed *An.* 1711. who has ſhewn me ſeveral of them now in his Poſſeſſion, which weighed about two Ounces. Among others the Reader may alſo conſult TULPIUS *Obſ.* 5. *Lib.* 3. MEEKREN, and MIDDLETON *Hiſtory* XI. and COLOT *Lib. de Lithot.* pag. 289. which equalled a Gooſe-Egg, with many more Accounts of the ſame Nature in the Writers of *Obſervations*.

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Surgeon's Assistance, when the Stone is retained in the Bladder from a Stricture of its Sphincter or Neck, till, having grown to a large Size, it occasions the most exquisite Pain, and other Symptoms, so as to render the Extraction of it absolutely necessary, when lithontriptic and diuretic Medicines prove of no effect.

Incision often unnecessary in Women.

III. Another great Privilege enjoyed by the female Sex over the male is, that they may be generally freed from the largest Stones, barely by dilating the Neck of the Bladder and Urethra, without the dangerous Operation of cutting. It is even surprizing to what a degree the Urethra and Neck of the Bladder may be dilated in Women, without incurring any great Damage, which is a Circumstance proved not only by the many Instances of very large Stones, being this way discharged without chirurgical Helps, but also by the numerous Testimonies of the most considerable Lithotomists, among which we have a very remarkable Case published in *Miscell. Nat. Cur. Obs. Dec.* II. *An.* X. pag. 147. where the Woman was freed from a Stone weighing five Ounces and a half, barely by dilating the Urethra; nor are the Cases less remarkable published in *Philos. Transact.* N. 202, 236, and elsewhere; though it must be confessed, that the Operation succeeds much better in young than old Patients.

The Method of extracting various.

IV. The Case being thus, there are not so many Instruments required to extract the Stone from Women as from Men; however, there are more Methods contrived to extract the Stone from the former than from the latter, which may, for Distinction's sake, be divided like the Method of Lithotomy in Men, into the *Apparatus minor & major*, with the high and lateral Operation, each of which may be again performed by different Methods. We shall begin here with the first, which may be performed variously, according to the particular Circumstances of the Case; but before we enter upon this Subject, it will be necessary to consider what Method will be most convenient, since there are several, and the most ancient of them described by Celsus, is commonly termed the *Apparatus minor*.

Apparatus minor.

V. The ancient Author of the *Apparatus minor*, Celsus [g], tells us, that when the Stone is small, the Use of the Knife is unnecessary, because it may be generally forced through the Neck of the Bladder with the Urine, or if it sticks by the Way, it may be extracted with a Hook [h]. But when the Stone is too large to be this Way extracted, the Surgeon is then to pass his Finger into the *Anus* of the Patient (if a Girl) in order to press the Stone towards the left Side of the [i] Perinæum, and to cut upon it as in Males, according to the Direction of Albucasis, who advises to pass two Fingers in this manner into the Patient's Anus, or Vagina, in order to find the Stone, and thrust it downwards towards the left Side of the Anus, or Tubercle of the Ischium, that, being felt by the Fingers externally in the Perinæum, an Incision may then be made down to the Stone, without injuring the Bladder, and the Stone appearing is to be thrust out by the Fingers *in Ano*, or extracted as in Men. Meekren also uses this Method of passing his two Fingers into the Vagina, to expel the Stone when it sticks in the Urethra; by which means, with the Assistance of a Hook,

[g] *Lib. VII. Cap.* 26. *N.* 4.

[h] By which means Saviard extracted a Stone from a Girl, *Obs.* 86.

[i] Some of the Moderns advise to press upon the Abdomen and Bladder with the right Hand, whilst the left is searching *in Ano*.

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he ſeldom fails in his Intention. This Method has been alſo generally received with this Difference, that ſome firſt of all dilate the Urethra with Inſtruments [i], others divide it according to Neceſſity, and then extract the Stone with a Hook, or Pair of Forceps, when it cannot be preſſed out by the Fingers only; but then the Operation in my Opinion ought to be referred to the *Apparatus major*. The celebrated *Engliſh* Surgeon Mr. JOHN DOUGLAS has propoſed a new Method agreeing with the *Apparatus minor*, by which the Urethra is to be gradually dilated with Tents made of Gentian Root, or prepared Sponge, till the Capacity is ſufficient to admit the Forceps for extracting the Stone. The Exiſtence of the Stone in female Patients may be known by the Symptoms which it occaſions, and by ſearching with the Catheter and Finger [k], as we before propoſed for the *Apparatus minor* and *major* in Males; the Woman is to be alſo ſecured in the ſame Poſture, and the *Labia pudendi* with the *Nymphæ* are to be held aſunder by the Aſſiſtant, whoſe Office was to hold up the Scrotum in the male, that the Lithotomiſt may have a clear View of the Parts below the *Clitoris*. See *Tab.* XXIX. *Fig.* 2. *Lit.* D, which, being rightly performed, the Surgeon may proceed to his Operation by the Method which ſhall appear to him to be the moſt convenient. When one Stone is extracted, he ſhould then ſearch for more, if any, and extract them in the ſame manner; but there will be ſeldom any Occaſion for binding the Patient in this Method, eſpecially when the Stone is ſmall, and the Extraction of it may be made by placing the Patient a-croſs a Bed.

VI. There is another Method of extracting the Stone from Women, which agrees with the *Apparatus major* uſed for Men, and may be therefore termed the *Apparatus major* for Women, ſince it requires more Inſtruments for performing it, which are not very different from thoſe uſed in the ſame Method for Men; but there are ſeveral Ways of proceeding, as well in this as in the preceding Method; but the following is moſtly uſed among the Moderns. The Woman being diſpoſed upon a Table, like the Male for the *Apparatus major*, and lateral Operation, being ſecured by Aſſiſtants, and the *Labia pudendi* and *Nymphæ* held open as before, the Operator proceeds to paſs a male and then a female Conductor, *Tab.* XXVIII. *Fig.* 2 and 3, thro' the ſhort Urethra into the Bladder, according to the Directions given for the *Apparatus major* in Chap. CXL. In the next Place, the Surgeon gradually dilates the Neck of the Bladder and Urethra, by opening the Conductors. See *Tab.* XXIX. *Fig.* 2. B. C. then he paſſes a Pair of Stone Forceps, *Tab.* XXVIII. *Fig.* 5. between the two Conductors into the Bladder, and by them ſtill further dilates by degrees the Neck of the Bladder ſufficient to admit a Paſſage for the Stone, which is to be extracted with the Forceps, as we before directed in Men [m], which may be generally done without much Difficulty, when the Stone is ſmall, ſmooth-ſur-

Apparatus major.

[i] As TOLET adviſes in his Lithotomy, *Chap.* XV. But HILDANUS thinks this Method dangerous, and apt to be attended with an Incontinency of Urine.

[k] When the Stone is too large to be thus extracted, Mr. DOUGLAS adviſes to cut for it by the high Operation. See his *Lithotomy* Edit. 2. pag. 55. & *Philoſ. Tranſact.* N°. 399.

[l] The Size of the Stone may be beſt judged of by the Finger.

[m] This is the Method deſcribed by TOLET *(Cap.* XV.*)* SAVIARD *(Obſ. Chirurg.* 72.*)* and GARENGEOT without mentioning any other way; though it is certain, that the *Apparatus minor* may be uſed, when this here deſcribed is not ſo convenient.

faced, or of a moderate Size; but when it is large, the Taſk is harder; however, the Urethra is then alſo to be gradually dilated till the Stone follows. When the Stone cannot be readily found with the Forceps in Women, the two Fore-fingers of the left Hand may be paſſed into the Vagina, and the Stone thereby thruſt into the Mouth of the Forceps; but in Girls it may be ſufficient to paſs one Finger only into the Anus. But if, after all, the Stone proves too large to be thus extracted, the Operator ſhould then uſe a pair of ſtronger Forceps made with large Teeth, repreſented in *Tab.* XXVIII. *Fig.* 7. and endeavour to break the Stone, that it may be extracted in pieces; but if the Stone is too hard to be broke, or if we are deſirous to extract it whole, it will then be neceſſary to divide the Urethra, either in one or both Sides, and, if there be Occaſion, he may, in my opinion, venture to divide ſome Part of the Neck and Body of the Bladder itſelf, ſince that may be ſafely done in Men in the lateral Operation, as we are aſſured by the Inſtances of RAW, CHESELDEN, and others. HILDANUS[n] indeed thinks it dangerous to divide the Neck of the Bladder; but we are ſatisfied it was only from the prejudiced Notion then entertained by the Ancients after HIPPOCRATES; and PAREY[o] ſeems to approve of this Operation, ſince he has recommended and repreſented a particular kind of grooved Catheter for dividing the Urethra in Women when there is occaſion; which Inſtrument is alſo approved by COLOT, and agrees with that repreſented by us in *Tab.* XXXII. *Fig.* 7. Some Lithotomiſts uſe a canulated Conductor through which they paſs the Forceps into the Bladder as in Men. To prevent an Incontinency of Urine from the great Diſtenſion of the Parts, it may be ſerviceable to apply an aſtringent Fomentation for a few Days; though this is an Accident which does not ſo often happen in young, as in old Patients; yet, if the Parts are wounded, it will be alſo neceſſary to treat them with vulnerary Medicines.

Some Variations.

VII. MARIANUS thinks it moſt adviſeable to leave the Expulſion of ſmall Stones to Nature, as the Urethra in Women is very ſhort and lax; but if the Stone is very large, he thinks it will be neceſſary to extract it by the Method propoſed for Men; but the Place to be inciſed he ſays elegantly is in Women between the *Os femoris* and Urethra, ſo that when the grooved Catheter is in the Bladder, the Operator is to thruſt the End of it outward towards the Perinæum, in order to cut upon it as we before directed; in the mean Time an Aſſiſtant is to hold the *Labia pudendi* and *Nymphæ* on the left Side towards the right, that the Operator may have a diſtinct View of the Part to be inciſed, which he then proceeds to divide about a Finger's breadth from the Thigh, making his Inciſion and Extraction in the ſame manner, and with the ſame Inſtruments as in Men; nor ſhould the Surgeon be terrified, ſays MARIANUS, if the Operation be attended with a more copious Hæmorrhage in Women than Men[p]. Though the particular Part to be inciſed is not ſo diſtinctly pointed out by MARIANUS, as we could wiſh; I am apt to think that he

[n] Lib. *de Lithot.* Cap. XXII.

[o] Lib. XVI. Chap. 47.

[p] Which has been alſo adviſed by CELSUS Lib. 7. Cap. 26. N. 4. And at N. 5. he ſays, that the Blood ought not to be directly ſtopped in robuſt Patients, to prevent any Inflammation of the Parts.

meant

meant the ſame Place in which JAMES and RAW made their Inciſions in Women. Some Operators uſe a peculiar Inſtrument commonly called a *Dilator*, in order to open the Parts, which Inſtrument they paſs between the two Conductors, in order to dilate the Neck of the Bladder before they introduce the Forceps and extract the Stone. For my own Part, I uſually thruſt my Fore-finger, inſtead of the forementioned Inſtrument, between the two Conductors, and paſs the ſame into the Bladder, as I before obſerved in the *Apparatus major*, in order to make way for the Forceps; by which Method the ſaid Dilator may be omitted, and the Neck of the Bladder more gradually and gently dilated. Some Lithotomiſts[q] rather adviſe to inlarge the Urethra by Inciſion, or even to cut into the Body of the Bladder itſelf, than to contuſe and lacerate the Parts by a too violent Diſtenſion, which will be attended with many bad Symptoms that may be avoided by Inciſion; others[r] again affirm, that there is never any Occaſion to divide the Parts by the Knife which they ſay will be attended with worſe Symptoms than a bare Dilatation, in favour of which Opinion they alledge the Inſtances of large Stones being diſcharged by Nature without any Inciſion; and by Art only making a Dilatation; which Opinion is much countenanced by MOLINEAU of *Dublin*, (*Phil. Tranſact.* N° 202.) and in Part confirmed by Caſes which he enumerates, and particularly a Girl of ſix Years old, whoſe Urethra was ſo largely dilated by M. PROBY of the ſame City, by means of a *Speculum Veſicæ*, that he afterwards introduced the Forceps, and extracted the Stones with Eaſe; he reports the ſame alſo of two adult Women, and gives us the Figures of the Stones extracted, concluding that if the Urethra may be thus dilated in young Subjects, it may be much more ſo in thoſe who are adult, ſo as to make it altogether unneceſſary to wound the Urethra or Bladder; but it is to be obſerved, that the Stones thus extracted were all of them but ſmall, the largeſt of them hardly exceeding the Size of a Pidgeon's Egg; and therefore I readily grant, that much larger than them may be this way extracted; but Stones of all Sizes cannot be thus taken from the Bladder, as M. WOOD[s] affirms, and proves by a Caſe of a Woman whom he happily cut, and freed from a Stone weighing ℥ ix, which he reaſonably aſſerts to have been impoſſible to extract barely by Dilatation. Therefore the Method of extracting Stones from Women ought to be prudently varied, and managed according to their Size, Figure, and other Circumſtances. Some paſs a grooved Catheter into the Bladder before the male Conductor, that the Point of the latter may paſs in through the Groove of the former. See (*Tab.* XXXII.) after which they introduce the other Inſtruments through the Cavity of the Male Conductor.

VIII. Frere JACQUES uſually cut Women in the ſame manner as he did Men; though I am not ſenſible that his Method was followed by any but RAW[t]; the generality of Lithotomiſts having adhered to the preceding Method, By the lateral Method.

[q] As ROSA and SCHAFFERUS in Diſſert. *de Calc. Argentorat.*
[r] LAVATERUS Diſſert. *de Calc.* pag. 231.
[s] *Philoſ. Tranſact.* N. 209.
[t] Oratione *de Methodo Anatomiam docendi*, pag. 37. where he mentions one Girl among the vaſt Number of Males he had cured.

and rejected the lateral Method for its Danger and Difficulty[v]; but I muſt declare it as my Opinion, that both of thoſe Methods may be practicable to the Advantage of the Patient, whenever the Stone is found to be too large to paſs the Urethra without greatly injuring the Neck of the Bladder. Nor is there any Danger of weakning the Neck of the Bladder by cutting according to JAMES's Method, provided the Operator is cautious, not to wound the Rectum, or Vagina, which was generally the raſh Practice of JAMES. Indeed thoſe Accidents may be eaſily committed, as appears from the Obſervation of SERMESIUS, who, upon opening many female Subjects that had been cut by the lateral Method, eſpecially Girls and Maids, found the Vagina entire; but in all that had born Children, the Vagina was wounded, which is a Circumſtance that I myſelf have frequently obſerved in dead Subjects. FALCONET alſo declares, that there is much more Caution required to perform the lateral, than any other Method of Lithotomy in Women; and therefore he thinks it moſt adviſcable to cut by the high Operation, when the Stone is too lage to be extracted thro' the Neck of the Bladder, otherwiſe he approves of dividing the Vagina with the Bladder and its Sphincter by cutting in the Groove of a Catheter, which Inciſion is better performed upon the Stone itſelf thruſt towards the Neck of the Bladder, according to the Opinion of BUSSIERE[x]. Not much differing from the preceding is the Method propoſed for Women by MERY, who, in order to prevent the Neck of the Bladder from being contuſed or lacerated by a too violent Dilatation, which would cauſe an Incontinency of Urine, adviſes to paſs a grooved Catheter into the Bladder, and to cut through the Sphincter-veſicle, together with the contiguous Part of the Vagina[y] as in Males; by which means the Stone may be extracted without dilating, contuſing, or lacerating the Neck of the Bladder, only by dividing it, which is not attended with the malignant Symptoms of the former, but heals up in a ſhort time; for we find that it was an Obſervation, and even a Rule with Phyſicians in the Time of CELSUS, that inciſed Wounds were leſs dangerous, and more ſpeedily to be cured, than thoſe which were contuſed or lacerated; and therefore it is the leſs ſurprizing that HILDANUS ſhould have freed a Woman from a Stone as big as a Hen's Egg, by cutting almoſt in the ſame Method through the Vagina, and Part of the Bladder, dilating the Wound partly with his Finger, and partly with the Knife down to the Neck of the Bladder, ſufficient for the Extraction of the Stone by the Forceps; and thus he made a perfect Cure of the Patient. See *Cent.* I. *Obſ.* 68. *Cent.* III. *Obſ.* 69. where he relates the Caſe of an Ulcer perforating the Bladder and Vagina, through which many Stones were diſcharged, and the Parts healing afterwards, ſhew Wounds therein to be curable.

[v] Indeed M. DENYS recommends the Method of RAW for Women, (*Obſ. de Calc.* Cap. X.) but does not give us any Inſtance of himſelf having performed it; and though RAW tells us he performed it on a Girl of four Years old at *Leyden*; yet I cannot learn, that it has been undertaken by any of the *French* or *Engliſh* Surgeons.

[x] *Phil. Tranſ. Abr.* Vol. III. pag. 185 & ſeq.

[y] This Practice was deſcribed before MERY by Dr. LISTER in his Journey to *Paris*, pag. 237, where he ſays, Women are moſt eaſily cut by paſſing the Scalpel through the Vagina into the Bladder.

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IX. We have another Method propoſed by DOUGLAS, when the Stone is too large to be extracted through the Neck of the Bladder, by dilating it with a Tent of Gentian Root, or prepared Sponge, ſufficient to admit the Forceps, as we obſerved § 5. in this Caſe M. DOUGLAS approves of cutting by the high Operation; that is, by diſtending the Bladder with warm Water, and compreſſing the Urethra, by inſerting the Finger in the Vagina, after which an Inciſion is made into the Bladder immediately above the *Os pubis*, as we before directed for the high Operation in males. I muſt needs approve of this Method when the Stone is very large, and the Patient young and healthy, becauſe in this Way there is no Danger of wounding or weakning the Sphincter of the Bladder, ſo as to bring on an Incontinency of Urine; but for ſmall Stones I prefer the *Apparatus major* and *minor* propoſed in this Chapter, as being leſs dangerous; of which Opinion we alſo find MORAND, who ſays, that when the Stone is ſmall in Women, it may be extracted by dilating in the common Method; but if it be large, the Patient ſhould be cut by the high Operation, to avoid an Incontinency of *Urine*, which is otherwiſe a very frequent and troubleſome Symptom.

DOUGLAS's Method by the high Operation.

X. It is to be obſerved, that Stones in Women are ſometimes formed, not ſpontaneouſly, but by an Incruſtation of large Needles, or the Bodkins which they uſe in their Hair, or ſuch like Bodies, ſlipping into the Bladder, in puſhing back a Stone from its Neck, or perhaps thruſt into thoſe Parts with a laſcivious Deſign; for whenever there are any foreign Bodies of that kind in the Bladder, the earthy and tartarous Parts of the Urine adhere to their Surface, and in Time form very large Stones. Inſtances of this kind we have ſeveral given us by MOLINET, ALGHISH, GREENFIELD, CHESELDEN, and others; but the moſt ſurprizing of all is that in the *Philophical Tranſactions*, N° 260, of a Girl about twenty Years old, from whom M. PROBY extracted the Stone by the high Operation without diſtending the Bladder, the Baſis of which Stone was a Hair-pin, which had been ſwallowed, and made its way into the Bladder; but I am apt to believe, that that Pin, which was about the Length of ſix Fingers Breadth, and proportionably thick, could not eaſily be ſwallowed, nor make its way through the Stomach into the Bladder; but I rather believe, that it was puſh'd through the Urethra, with a laſcivious Deſign by the Girl, who, according to that Author, was of a warm and ſanguine Habit. It is remarkable, that this Inſtance of cutting by the high Operation with Succeſs, was not obſerved or mentioned by any of the *Engliſh* or *French* Lithotomiſts, who have writ upon that Method, notwithſtanding it is one of the greateſt Arguments in Favour of the Operation, which they endeavour to recommend; and therefore one would imagine the Caſe had ſlipt their Notice [z].

The Stone formed on Bodies thruſt into the Bladder in Women.

[z] In the *Philoſophical Tranſactions* N° 168. Dr. LISTER gives an Account of a Lad cut by COLOT, the Baſis of whoſe Stone was found to be a Needle, which he had thruſt into his Bladder about two Years before. To which I may add, that my Son ſaw SENFIUS (at *Berlin* in 1735.) extract a Stone from a Man, in which was found a Spike or Beard of Barley; but by what means it came there, neither the Patient nor any body elſe could imagine.

CHAP.

OF MIDWIFERY.

CHAP. CXLII.

The Method of treating difficult Births, the Fœtus being alive.

Obſervations previous to the Art of Midwifry.

I. HARD Labour is, when the Mother is not delivered in the ſhort and uſual Time of about the Space of an Hour [a], the Excluſion of the Fœtus being impeded by various Cauſes, which render the Birth impracticable, without ſome Aſſiſtance from the Hand of the Midwife; it is by the *Greeks* called Δυστοκιὰ. The Cauſes of which are a bad Conformation of the Parts, particularly the Bones of the *Pelvis*, with the *Os ſacrum* and *Coxcyx*, as in crooked Women; by which means the Capacity of the *Pelvis* is too narrow to admit the Hand. Another Cauſe may be the Age of the Patient, being either too young or too old, or being too tender and timorous, or too full of Blood. Sometimes it may be from an immature Labour, before Nature has compleated her Work, or from the Waters breaking forth before their proper Time, or being retained beyond it; or, laſtly, when the Mother does not aſſiſt her Labour-pains by ſtraining; or when the Fœtus does not preſent in its natural Poſture. When ſeveral of theſe Cauſes concur, the Delivery is ſo much the more difficult. Whenever a Phyſician, Surgeon, or Midwife is called to a Woman in her Labour-pains, their firſt Buſineſs is to enquire, whether the Birth is mature, or the Woman gone her full Time of nine Months; and, in the next Place, to examine whether the *Os Uteri* is relaxed or cloſed. For when that Time is not expired, and no other Labour-pains [b] are felt, the Infant preſenting it ſelf, and the *Os Uteri* not being relaxed, in that Caſe both the Application of the Hand, and Medicines which promote the Birth, ought to be carefully avoided; Care ſhould rather be taken to diſpoſe the Patient to reſt in a warm Bed, and to endeavour to remove the falſe Pains by a prudent Exhibition of proper Medicines internally, with the Application of diſcutient and ſtrengthening Cataplaſms and *Sacculi*; by which means the Patient frequently goes her proper Time. It is to be wiſhed, the Fault of exciting immature Births by Medicines, was not ſo common as we generally find it, by which unſkilful Treatment, Death is too frequently brought on. But if the Woman has gone her nine Months from the Time of Conception, and her true Labour-pains appear, which may be known by their proceeding from the Loins downward towards the *Pubes*, the Limbs at the ſame Time trembling, and attended with an urging Teneſmus and Relaxation of the *Os Uteri*, the Method of

[a] It is not the Buſineſs of this Place to explain the Nature and Cauſes of natural Births; for that Doctrine, I ſuppoſe, the Reader may be acquainted with from Anatomy and Phyſiology.

[b] Labour-pains are uſually diſtinguiſhed into *true* and *falſe*, or ſpurious; the true are thoſe which come upon a Woman at or near the End of her full Time, and, beginning at the Loins, proceed downward to each Inguen, and to the Parts of Generation: the falſe, or ſpurious, are thoſe perceived in the upper and middle Part of the Abdomen, like a Cholic, ariſing from Wind, or Indigeſtion, and are no Sign of Delivery. The true Pains are alſo diſtinguiſhible from the Spurious, by the *Os Uteri* dilating or relaxing itſelf in the firſt, but contiuing contracted or cloſed in the laſt.

examin-

examining which, ſee *Tab.* XXXIII. *Fig.* 1. In that Caſe the Woman ſhould be put to Bed, and uſe all her Endeavours to promote the Delivery, or ſhe may be placed in a Chair contrived for that purpoſe; and if her Delivery does not ſucceed, notwithſtanding the Relaxation of the *Os Uteri*, it may then be neceſſary to uſe other proper means, which we ſhall preſently deſcribe; but, firſt, it may not be amiſs to obſerve, that it is cuſtomary with the *French*, and ſeveral other Nations, to deliver their Women upon the Bed; but in *Germany* that Buſineſs is uſually performed ſitting in a kind of Chair for that purpoſe, repreſented in *Tab.* XXXIII. *Fig.* 14. which laſt Method is, in my Opinion, much preferable on ſeveral Accounts; and firſt, becauſe they can better exert their Strength, by fixing their Feet upon the Ground, and their Back againſt the Chair A, their Thighs upon the Croſs-board C, which has a ſemicircular Piece cut out of it; that the *Os coccyx* may have room to bend back, the Patient at the ſame time holding the two Handles D D faſt in her Hands; and thus the Patient can not only exert her Strength to more Advantage, but alſo the Midwife and her Aſſiſtants can have better Acceſs to perform their Office. In Places where one of thoſe Chairs are not to be had, two common Chairs of the ſame Height may be placed together, about ſix or eight Inches diſtance from each other, and tied faſt in that Poſition, that the Patient may ſit with a Thigh upon each Chair, and her Genitals hanging over the intermediate Space betwixt them; by which means the *Os ſacrum* and *coccyx* have their free Liberty to recede at the Time of excluding the Fœtus. Among the Country-Folks, and meaner Sort of People in *Germany*, it is ſometimes cuſtomary for the Huſband, or a ſtrong Woman, to ſit down in a common Chair, taking the Patient upon her Thighs, and holding her in their Arms, perform the Office of the Laying-Chair.

II. But it is previouſly neceſſary for the Surgeon or Midwife to have had an Idea of the Form and Situation of the *Os Uteri*, either from Anatomy or Anatomical Figures of the Part which is repreſented in *Tab.* XXIX. *Fig.* 2. L. or *Tab.* XXXIII. *Fig.* 1. C. and in the next Place they are to obſerve that this *Os Tincæ*, or *Uteri*, is in pregnant Women ſo ſtrictly cloſed, except at the Time of Delivery, that it will ſcarce admit the End of the leaſt Finger; in which State it continues till the true Time of Delivery approaches. When none of the true Labour-pains are felt, this Part continues ſhut; but if the Pains are genuine, it gradually dilates itſelf ſufficient to admit ſeveral of the Fingers, the inveſting Membranes of the Fœtus at the ſame time protruding through the opening like a Bladder diſtended with Water, in which ſome Part of the Fœtus may be frequently perceived by the Fingers, which is therefore a certain Sign of a ſpeedy Delivery, and the more ſo, as the *Os Uteri* is more dilated. But, in order to examine the State of the *Os Uteri*, it will be neceſſary for the Surgeon or Midwife to paſs their Middle-finger dipt in Oil into the Patient's Vagina. See *Tab.* XXXIII. *Fig.* 1. and gradually inſinuating it into the Uterus, the Condition of its Mouth may be perceived, and the Time of Delivery thereby known either to be at hand or not; by the ſame means may be alſo perceived whether the Uterus inclines to either Side, or is diſpoſed directly in the middle, which laſt is a Sign of a happy Delivery, as alſo whether the Head, Foot, Hand, or other Part of the Fœtus preſents itſelf; from whence may be drawn a reaſonable Prognoſtic, whether the Birth will be eaſy or difficult, as Deventer, a *Dutch* Phyſician, and Van Hoorn, with Widemmania, have well

The *Os Uteri* ſhould be examined.

well deſcribed in their Books of Midwifery; but without this Touch nothing certain can be determined. There is one Circumſtance to be obſerved in examining by the Touch, and that is to do it when the Pains are remiſs, and to ceaſe when the Pains come on again till they are paſt; and thus the Midwife may be ſatisfied of every particular Circumſtance.

Poſture of the *Fœtus* in Delivery.

III. This being premiſed, when a Phyſician or Surgeon is called to a Woman in Labour, their firſt Buſineſs is to make a diligent Enquiry of the Midwife, in what Poſture the Infant preſents itſelf in the Womb, whether its Poſition be natural, or preternatural. The moſt natural and convenient Poſture is judged to be, when the Fœtus preſents with its Head downward, and its Face backward towards the Rectum, its Occiput towards the Bladder, its Feet upwards towards the Uterus, and its Vertex or Bregma in the middle of the *Os Uteri*, as in *Tab.* XXXIII. *Fig.* 2. all other Poſitions are accounted unuſual or unnatural. But there ſtill remain two Poſtures, which may be in ſome meaſure eſteemed natural, or at leaſt they cannot be termed preternatural, ſince the Infant may be thereby delivered alive, and with no great Difficulty; one of theſe is, when the Feet of the Infant preſent themſelves foremoſt, and then the Birth is termed *Agrippi*, ſee *Fig.* 3. The other is, when the Hips or Nates preſent themſelves to the Mouth of the Vagina, ſo that the Infant is obliged to be drawn out with its Body in an inflected and unnatural Poſture, as in *Fig.* 4. But every Birth does not ſucceed well, in which the Child preſents itſelf in the laſt Poſture; for if the Infant be not quickly delivered by a prudent Midwife, or Surgeon, but remains ſome time in the Paſſage, it muſt, from the violent Stricture of the Parts and Navel-ſtring, inevitably periſh, even in the Birth. But when the Feet preſent themſelves firſt, the Infant may be then not only preſerved alive, but alſo delivered with much more Eaſe, eſpecially when in the Hands of a prudent Midwife, or Surgeon. And, to ſay the Truth, when other Circumſtances agree, this Poſture may be eſteemed the beſt and moſt convenient of any for the Midwife, becauſe in that the Mother may be aſſiſted more conveniently, as we ſhall hereafter declare more at large. If the Infant lies in any other Poſture, as it may in a great many, which are very dangerous, ſome of which we have repreſented in *Fig.* 5, 6, 7, 8, 9, 10, 11, 12. the Birth is then not only difficult but impracticable; and the Mother and Infant are both in Danger, if the latter be not turned into a convenient Poſture, and then delivered by ſome prudent Surgeon or Midwife.

Management of the Infant preſenting in a natural Poſition.

IV. If the Foot or Hand of the Infant does not preſent, ſo as to indicate to the Midwife its Poſition in the Womb, a Search is to be made, either with the Finger, as we have before directed, or, if the *Os Uteri* be ſufficiently open, by paſſing the whole Hand [c] cautiouſly into the Uterus, and this when the Pains are off, or at leaſt very remiſs, without which a Perſon may be greatly deceived. If the Head [d] of the Infant preſents to the Mouth of the Uterus (which ought to be well known and diſtinguiſhed by the Midwife from the other Parts of the Body, as the Nates, Knees, Shoulders, *&c.*) and its Body appears either by paſſing the Hand, or by the Touch to be properly diſpoſed; and not-

[c] A ſmall and ſlender Hand is moſt commodious for this Office.

[d] The Unſkilful often miſtake the Shoulder, Knee, Elbow, *&c.* for the Head, to the Injury both of the Mother and Infant.

withſtanding

withſtanding the Birth does not well ſucceed, we may then reaſonaby conjecture that there is ſomething amiſs, either in the Mother or the Fœtus; in the firſt, through Fulneſs of Blood, Weakneſs, Straitneſs of the Parts, either by a Contraction or Tumour, an oblique Poſition, or other Defect: In the Fœtus, when its Head is of an unuſual Size, or its Body inconveniently placed, preſenting either the Chin, Face, Ears, Occiput, Shoulders, Arms, Breaſt, Back, or other improper Part. If the Strength and Labour-pains of the Mother are abſent, and the Fœtus being at the ſame time in a convenient Poſture, but cannot be delivered, either from the Largeneſs of its Head, or Narrowneſs of the Paſſage, it will then be altogether neceſſary to aſſiſt the Mother in her Labour, by adminiſtring proper Aliments and ſtrengthening Medicines, and then to paſs the Hand, firſt anointed with Oil, into the Vagina, in order gradually to dilate the Parts, and preſs back the *Os coccyx* ſtrongly at the inſtant when the Pains and Throws of the Mother exert themſelves, by which means the Delivery often happily ſucceeds: But if any other Impediment ſhould be ſtill remaining, it ſhould be alſo removed in courſe, as if there be a too great Redundancy of Blood, a Vein ſhould be opened; if the Paſſages ſhould be too narrow, as they frequently are in the firſt Childbirth, or if they are too dry in thoſe who are advanced in Years, it may then be proper to lubricate them with Butter, Oil, or other emollient Subſtances, and then to dilate the Parts with the Hands and Fingers, as we ſhall preſently declare more at large[e]. If the Vagina ſhould be obſtructed by ſome Membrane, it may be removed by proper Inſtruments in the manner we have directed at *Chap.* CXLVI. *& ſeq.* If the Parts ſhould be ſo much ſwelled as to deny a Paſſage to the Fœtus, they ſhould be fomented with diſcutient Cataplaſms, or Decoctions *ex flor. Chamomelæ Verbaſci Sambuci & fol. Altheæ, Malvæ*, &c. boiled in Milk, and applied warm. If the Paſſage of the Vagina ſhould be obſtructed by any Tumour, large Fungus, or fleſhy Excreſcence, it may be proper to extirpate the ſame, as we have directed in *Chapter* CXLIX. Laſtly, if the Paſſage ſtill remains too narrow, either from a Calloſity, or Adheſion of the *Os Uteri* and Vagina, or the like, or if the Uterus ſhould be burſt, and the Fœtus preſſed into the Cavity of the Abdomen, there then remains but one and a ſevere Method of extracting the Fætus, *viz.* by the *Cæſarean* Section, concerning which we have treated at large in *Chapter* CXIII. But if none of theſe Obſtacles appear, and the Birth does not ſucceed, from the Parts being too narrow, notwithſtanding the Infant lies in a proper Poſture, and is aſſiſted by the Mother's Throws; in that Caſe the Patient is to be firſt laid in a proper manner upon a Bed, with her Hips raiſed ſomewhat higher than her Head, or ſhe may be placed in the Chair at *Tab.* XXXIII. *Fig.* 15. and, after diſcharging her Urine, the Midwife is to paſs her Hand, lubricated with ſome Ointment, Oil, or other fat Subſtance, into the Vagina[f], and therewith gradually to dilate the Parts, and preſs back the *Os coccyx* more eſpecially at the Inſtant of the Mother's Pains and Throws; by which means the Head will by degrees follow the Hand, which may lay hold of it, if poſſible, and draw it

[e] We have a remarkable Inſtance given us by VOLTERUS (*de Art. Obſtet.* p. m. 112.) of a Woman, whoſe Paſſages were ſo narrow, that out of ſeven Births, not one ſucceeded, but the Fœtus was obliged to be extracted in Pieces. More Inſtances occur in medical Writers.

[f] It is to be obſerv'd, that the Labour-pains are ſeldom abſent, when the Hand is thus introduced into the Womb, where its Stimulus is uſually ſufficient to excite them.

gently out, or if its Body preſents in an oblique or preternatural Poſition (as in *Tab.* XXXIII. *Fig.* 8 & 9.) Endeavours are then to be uſed to turn it into its natural and eaſy Poſture with the Hand, not neglecting at the ſame time to adminiſter ſtrengthening Medicines to the Patient internally, to excite the Birth when it is impeded by the Abſence of her Labour-pains. But if the Fœtus cannot be eaſily turned into its natural Poſition, the Feet are then to be taken hold of, and drawn out with the reſt of the Body. If the Membranes including the Fœtus are too tough and ſtrong to break of their own accord, ſo that they impede the Birth, notwithſtanding the Mouth of the Uterus is ſufficiently open, and the Head of the Infant may be felt through them, the Midwife may then venture to divide or lacerate the Membranes, either with her Fingers ends or a Hook; but Care ſhould be taken not to break them 'till the *Os Uteri* is ſufficiently dilated, otherwiſe the Birth will be thereby rendered extremely difficult. For the reſt, it is always adviſeable to abſtain from the Uſe of Inſtruments in difficult Labours as long as the Infant continues alive, and the Mother in full Vigour, otherwiſe there is Danger of wounding and maiming, if not of killing the firſt. But if the Mother's Strength fails her, and the preceding Symptoms of Death approach, or may be ſhortly expected, the Fœtus ſhould then be timely extracted, either by the Feet, or, when that is impracticable, by leſſening it with Inſtruments, in order to preſerve the Mother; for it is much better to endeavour by this means to preſerve one, or both, than, by too long Delays, to loſe both.

Admonition for this Poſture of the Fœtus.

V. It may be of conſequence to obſerve in this Place, that though the Head of the Infant preſenting to the Mouth of the Uterus is generally eſteemed the moſt natural Poſition; yet it ſometimes happens from the fore-mentioned Cauſes, and eſpecially from an oblique Situation of the Uterus, that not the Vertex of the Head, but rather its Sides, the Face, Ears or Occiput, correſpond to the Center of the Vagina, as in *Fig.* 8 & 9, by which means the Birth is frequently rendered ſo difficult, as not to give way, either to the Endeavours of the Mother, or all the Aſſiſtances of Art. The generality accuſe Largeneſs of the Child's Head, but unjuſtly, ſince that is frequently obſerved to be no larger than uſual, and is often actually paſſed through the narrow Mouth of the Uterus; but the moſt common Cauſe of this Difficulty, is rather the Shoulders of the Fœtus reſiſting againſt the Bones of the Pelvis, eſpecially when the Head preſents ſide-ways, and being too ſlippery and round to be held faſt by the Hands, its Extraction becomes thereby impracticable, and, being compreſſed by the Stricture of the Parts, it muſt inevitably periſh in a little time. Therefore when the Head preſents in this Poſition, it is rather feared, than approved of as a good Sign by the moſt expert Midwives, who therefore chuſe to alter its Poſition; for, in this Caſe, there is no paſſing of the Hand into the Uterus to turn the Infant, its Head being ſo cloſely wedged in between the Mouth of the Uterus and Sides of the Vagina; ſo that frequently no Aſſiſtance can be adminiſtred either to the Mother or Fœtus, but either one, or both, muſt be inevitably loſt. See *Chap.* CXIII. of the *Cæſarean Section*, as alſo DEVENTER, HOORNIUS, LE MOTTE, and others.

PALFYN's Method of operating.

VI. In this Difficulty PALFINUS, to avoid injuring the Fœtus with Hooks, or other rough Inſtruments, has contrived a kind of broad and double Scoop without any Edge, being flat, which, being applied to each Side of the Head, he

he thereby endeavours to extract the Fœtus without lacerating or wounding any Part of it. See the Figure of this Inſtrument, *Tab.* XXXIII. *Fig.* 16. but the Size of this Inſtrument, which was ſent me by the Author, is as large again as the Figure [g]. This Inſtrument he would have applied, when the Fœtus is yet alive, or at leaſt when we are not certain of its Death. But the generality of Infants, who have had their Heads compreſſed in this manner, are thereby ſo much weakened, and their vital Functions ſo much deſtroyed, that they may be looked upon as dead, and may be therefore extracted with Hooks by the common Method. I have indeed uſed this Inſtrument of my Friend PALFINUS, but without Succeſs; for if you compreſs the Head with it but gently, the Fœtus is held too firm to give way to it, and, if you preſs it too ſtrongly, there is Danger of wounding its tender Head. I therefore endeavoured to amend the Inſtrument, by joining its two Parts together with a Hinge, but even then it did not anſwer Expectation; ſo that in this deplorable Situation of the Fœtus we have no Remedy left but the *Cæſarean* Section, or to extract the Fœtus either dead or alive with Hooks (repreſented *Tab.* XXXIII. *Fig.* 17 & 18.) or other Inſtruments, to preſerve the Life of the Mother. However, we ſhall hereafter propoſe, at §. 16 & 17, ſome Artifices which may be of Service in Caſes of this Nature.

Management when the Infant's Poſition is unnatural.

VII. If the Infant ſhould be diſpoſed in any other unnatural Poſture, like thoſe repreſented in *Fig.* 5, 6, 7, 8, 9, 10, 11, 12, if it be not changed or turned by the Hands of a dextrous Midwife, it will be hardly poſſible for the Birth to ſucceed; but the Life both of the Mother and Fœtus will be in the utmoſt Danger. In that Caſe the Adminiſtration of forcing Medicines to excite the Birth, will be highly pernicious, by ſpending the Mother's Strength before it is requiſite, or killing the Fœtus by a too violent Compreſſion of the Womb, by exciting a profuſe Flooding; or, laſtly, by cauſing a Rupture or Gangrene, if not other malignant Symptoms: Therefore nothing is more neceſſary, in this Caſe, than dextrouſly to turn the Child into a proper Poſture by the Hand, and then to extract it ſo ſoon as poſſible. We are furniſhed with many Artifices by Authors for turning and extracting the Fœtus; but not a few of them are either impracticable or pernicious; for there ſeems to be no more certain Way of inverting the Child in the Womb, and of extracting it, than by prudently introducing the Hand, after it has been oiled, into the Uterus; ſee *Tab.* XXXIII. *Fig.* 6, 10, & 11. and having laid hold of the Feet, the Infant is to be thereby gradually and cautiouſly extracted; and this we lay down as a general Rule to be obſerved, whenever the Infant preſents in an unnatural Poſture, except when the Head preſents very nearly in its right Poſture, or at leaſt may be very eaſily altered into it. Nor is any other method practicable, which we are directed to by ſome ancient, but leſs experienced Practitioners, I mean, to to turn the Child into its natural Poſition; when it cannot be laid hold of in ſo ſmall a Compaſs, the Uterus not only contracting itſelf to a very great degree; but the Roundneſs and Lubricity of the Head, are Obſtacles not to be ſurpaſſed; and even otherwiſe there would be great Danger of compreſſing and injuring the Brain, Eyes, and other Parts of the Head, by ſo great a Force as muſt be required to turn the Infant by that Part; and therefore the Advice of

[g] This I am told by my Friend, who communicated this Inſtrument of PALFYN's to me.

thoſe is not to be followed, who direct the Infant to be turned into its natural Poſture, in whatever manner it preſents in the Womb; and even Le Motte agrees with me, that though the Head of the Fœtus may be turned to its natural Poſition; yet it is often more adviſeable to extract it by the Feet, ſince the whole may be done in leſs Time than the Head can be inverted, by which means the Mother may be ſooner delivered, and the Infant more likely to be live-born. Even when the Head has been, after much Trouble, in this manner reduced into the deſired Poſture, the Delivery is not compleated, but Nature muſt perform her Part, and the Patient has in a manner all her Pains and Throws to go through again; and if ſhe ſhould be weak, or otherwiſe incapable, the Feet of the Infant muſt be again after all ſearched for, and thus extracted, tho' perhaps it may not be poſſible, or at leaſt not ſo eaſy again to paſs the Hand through the Mouth of the Uterus, now obſtructed by the Head of the Infant, ſo that by thus delaying, the Life of the Fætus is either loſt in the mean time, or in its Extraction, and the Mother ſuffers much more than ſhe need to have done, frequently expiring ſoon after, or elſe the Fœtus muſt be extracted by Inſtruments, as the laſt Remedy to ſave the Mother; it is therefore in my Opinion highly preferable to extract the Infant at firſt by the Feet, rather than to loſe Time, and perhaps miſcarry in the Operation, by endeavouring to turn its Head into the natural Poſture for Delivery.

When the Fœtus is to be turned.

VIII. Before we proceed to give particular Directions for inverting the Infant in the Womb, and extracting it, it will be firſt proper to declare in what Caſes it is highly neceſſary thus to turn and to extract the Infant by its Feet. This Inverſion and Extraction is to be therefore performed, 1. Whenever any other Part of the Infant preſents beſides the Vertex. See *Tab.* XXXIII. *Fig.* 5 to 12. 2. In all Caſes in which ſome other Part of the Infant comes out of the Uterus beſides its Head; and particularly when the Hand or Navel-ſtring appears in that manner, and the Midwife cannot return it without its being excluded again as before, at the firſt Approach of the ſucceeding Throws of the Mother. 3. Whenever the Head preſents itſelf ſide-ways with the Ears, Face, Chin, or Occiput towards the Mouth of the Uterus, being wedged in ſo as not to be turned without much Difficulty, as may be ſeen in *Fig.* 8 & 9. 4. Whenever the Back, Belly, or Side of the Infant preſents, as in *Fig.* 5 & 7. 5. When the Infant is even in its natural Poſition, but the Birth does not ſucceed, and there is Danger of loſing the Life either of the Fœtus or Mother by Delay, as when her Strength fails her, a violent Flooding enſues, or when ſhe is ſeized with Convulſions or epileptic Fits, in all which Caſes there is great Danger of loſing both the Mother and Fœtus, if the latter be not timely extracted by the Feet. 6. Whenever the Navel-ſtring ſlips out of the Uterus before the Head of the Fœtus; for if it be not then immediately extracted, the Circulation being intercepted between the Mother and the Infant, by compreſſing the umbilical Cord will be attended with the certain Death of the latter; and, laſtly, 7. we may add, whenever the Uterus is obliquely ſituated, notwithſtanding the Fœtus preſents in its natural Poſture; for it is generally much eaſier in thoſe Caſes to extract the Infant by its Feet than to alter the Poſition of the Uterus from an oblique to a ſtraight Direction; therefore in all theſe, and ſuch like Caſes, where Delay is dangerous, it is better in this manner to haſten the Delivery

Delivery, than to ſlip the critical Opportunity, as DEVENTER, and others, have largely demonſtrated.

IX. Among the innumerable preternatural Poſitions, in which the Infant preſents, we meet with none more frequent and dangerous, than when its Hand or Arm firſt appears, as in *Fig.* 11. which Poſition we ſhall therefore firſt conſider. If the Hand of the Infant is perceived through the Membranes at the Mouth of the Uterus before the Waters are diſcharged, it frequently withdraws that Part, of itſelf, if the Midwife pinches or hurts it Fingers, and turns its Head in the Room of it, whereupon the natural Birth ſucceeds [h]; but if the Waters are already diſcharged, it will ſignify nothing to pinch the Fingers, becauſe the Uterus is then ſo cloſely contracted, that its Hand is immoveable. The generality of Practitioners adviſe in this Caſe, to return the Arm or Hand into the Womb, and preſent its Head, after which they are to commit the reſt to Nature; but as there is great Danger in waiting in that manner, it is in my Opinion much better to extract the Infant as ſoon as poſſible by its Feet; for if the Arm comes firſt, the infant lying croſs with its Head on one Side, and its Heels on the other, it muſt be impoſſible for the reſt of the Body to follow the Hand of the Extractor; it is even generally much eaſier to pull off the Arm, than thereby to extract the reſt of the Body, except the Fœtus be imperfect, or elſe very ſmall, and then I have ſeen it ſometimes this way extracted. In this difficult Caſe the Midwife ought, without Delay, to paſs her Hand and Arm lubricated with Oil, into the Uterus, even up to her Elbow, when it is neceſſary, as in *Fig.* 10 & 11. and taking hold of the Feet, the Infant is to be thereby inverted and extracted, without ſtaying to replace its Arm, or remove its Head, which cannot be done without ſome Difficulty, eſpecially when it has been a conſiderable time in that Poſture. Whoever prudently conſiders this dangerous and difficult Preſentation of the Fœtus, and is alſo acquainted with the Structure and Poſition of the Uterus, and Bones of the Pelvis, will readily conceive in what manner the Infant is to be turned, when it preſents in other Poſtures, I need only adviſe them to take notice, that when they paſs the Hand into the Uterus, they ought to preſs it againſt that Part of the Vagina next the Rectum, otherwiſe they will meet with a Reſiſtance from the *Os Pubis*.

Eſpecially when the Hand or Foot appears.

X. Since we have propoſed this Poſture of the Fœtus as an Example, whereby the Midwife may know how to treat it when in others, we ſhall conſider it a little more at large; and, firſt, a convenient Poſture in the Patient is of no ſmall Importance, in order to procure an eaſy Delivery [i]; the Mother may be therefore moſt advantageouſly placed in a Chair for this purpoſe, having a moveable Back, which may be elevated or depreſſed at pleaſure, while the Patient's Back is ſupported by it, as on a Bed; ſee *Tab.* XXXIII. *Fig.* 15. or, when that is not at hand, ſhe may be laid a-croſs a Bed, Couch, or Table, or upon four common Chairs placed oppoſite to each other, which, being covered with

This Poſture further conſidered.

[h] This is an Obſervation of SIGISMUNDA, Midwife of *Brandenburg*, after whom it has been taken notice of by DEVENTER, and other Writers.

[i] Upon this Subject it may be worth while to conſult a Diſſertation, *de Partu difficili ex Infantis Brachio prodeunte, ſub* WEDELII *præſidio.* Jenæ 1723.

Cloaths

Cloaths and Pillows, the Patient may be laid on them, with her Hips elevated a little higher than her Head, and the Parts conveniently diſpoſed for the Midwife to peform her Office; this done, the next Buſineſs is to enquire which Hand of the Infant preſents, that thereby a Judgment may be formed in what manner the reſt of its Body lies in the Uterus; and if from this Conſideration it appears, that the Feet of the Infant lie on the left Side of the Abdomen, as in *Fig.* 11. in that Caſe the right Hand of the Midwife, being lubricated with Oil, ſhould be gently paſſed into the Uterus, and preſſing aſide the Head and Hand of the Infant, to make way for the reſt of the Arm, turning it gently towards the Legs and Thighs, afterwards endeavouring to lay hold of and extract the Feet of the Infant; and this ſhould be performed with the more Slowneſs and Caution as the Feet are very often ſeparated from each other, and ſtretched upwards; but when the Caſe has not been long delayed, nor the Uterus much contracted, the Feet being as yet pretty near together, there is then generally no great Difficulty in apprehending, and extracting the Feet in this manner. If the Feet are not in this manner laid hold of, all other Endeavours will prove fruitleſs, and the Uterus contracts itſelf ſo ſtrongly, as ſcarce to admit the Hand for this purpoſe, which generally requires it to be paſſed up to the Elbow, as in *Fig.* 10 & 11. If the Hand of the Midwife ſhould fail or be tired by too long ſearching, it may be then drawn out, and, after ſome Reſpite, introduced again, or the other uſed inſtead of it, to ſearch for the Feet, which, when found, are to be gently extracted, and the Infant thereby turned and drawn out, but not upward, nor in a ſtrait Line, but downward and backward, becauſe the Angle of the *Os pubis* is that way largeſt. If only one of the Feet can be found, it may be carefully drawn a little way out of the Uterus, and ſecured with broad Tape from being drawn in again. Then the Midwife paſſes her Hand, as repreſented in *Fig.* 12. in order to take hold of the other Foot, which, being gently drawn out like the other, both of them are then to be wrapt up in a warm linen or woollen Cloth, becauſe of their Lubricity, that they may be more firmly held, in order to make a gradual Extraction of the Infant, which ſhould be in a prone Poſture. But if the Hand cannot reach the End of the Foot, either from a Stricture of the Uterus, or other Cauſe, in that Caſe I take hold of the Leg, and thereby turn the Fœtus, and draw its Knee to the *Os Uteri*, and thereby the Foot, and then by both of them I deliver the Fœtus as before.

Some Obſervations and Cautions.

XI. If the Infant appears to lie in a ſupine Poſture, in extracting it, as in *Fig.* 3. when the Legs have been drawn out as far as the Abdomen, it ſhould be dextrouſly turned upon its Belly [k], by taking hold of the Hips, otherwiſe there will be Danger of the Chin ſticking againſt the *Os pubis*, and of the *Uterus* contracting itſelf about the Neck of the Infant, ſo as to kill it, as it frequently happens with baſe and imprudent Midwives: But when the Infant can be eaſily turned upon its Abdomen, the Birth generally proves eaſy; however, it ſhould

[k] The generality of the Moderns adviſe the turning of the Infant in this manner upon its Abdomen; but the experienced Hoornius aſks, with good Reaſon, whether it may not, in many Caſes, be better to free the Head, and other Parts of the Infant, from the Arch of the *Oſſa pubis* without turning it, in the manner we ſhall preſently direct; becauſe that Method often twiſts, or diſtorts the Neck of the Infant, and generally gives the Midwife more Trouble than freeing its Head, as before. See Hoorn. *Obſ.* 26.

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be obſerved which Side will be moſt convenient to turn it upon; and, in extracting it, it will be better to draw it out, by turning in a ſpiral, than in a ſtraight Direction; but if it has been drawn out as far as the Abdomen, and we are then unwilling to turn it in a ſupine Poſture, the Hand is then to be paſſed into the Uterus under the Arch of the *Os pubis* upon the Abdomen of the Infant, that while it is extracted by one Hand, its Face and other Parts may be prevented from being injured by the *Os pubis* with the other. To return the Arm of the Infant into the Uterus, when prolapſed before its Extraction, as ſome adviſe, is not only uſeleſs or unneceſſary, but very often dangerous and impracticable. If the Feet of the Infant are turned towards the right Side of the Mother's Womb, they may be moſt commodiouſly ſearched for and extracted with the left Hand. But it ſhould be obſerved, that there is ſome Reaſon for paſſing the Hand to the Extremity of the Thigh, when one Leg is extracted, and the other ſearched for, to ſee that they belong to one Infant, leſt there ſhould be Twins, and, by extracting two Legs of different Infants, both of them might be greatly injured[1]. The Methods which we have hitherto propoſed, will generally prove ſufficient in the Hand of a prudent Midwife for moſt preternatural Births: For if the Head does not directly preſent in its right Poſition before-mentioned in § III. the Feet are to be then ſearched for, and extracted in the manner here propoſed without Delay; by which means the Birth generally ſucceeds happily both to the Mother and Infant; but if it be delayed 'till the Uterus has ſo violently contracted itſelf, as hardly to admit the Hand, and allow Room for it to move, it renders the Caſe extremely dangerous for both, and particularly the Infant; and therefore it will be moſt prudent to compleat the Operation as ſoon as poſſible.

XII. From what has been now ſaid, the following Obſervations may be made: 1. If the Infant's Feet preſent, or come out of the Uterus, as in *Fig.* 3. they ought not to be returned, much leſs ought the Head of the Infant to be inverted in the room of them, as many have formerly directed; but, on the contrary, the Feet ſhould be taken hold of, and extracted as ſoon as may be with Conveniency, by which means the Birth will be much eaſier, even than when the Head preſents, provided the Infant is extracted with its Face downward, as we have before directed; but it is generally better for Women, who are this way delivered to be laid upon a Bed, than in the Chair deſcribed for that purpoſe. 2. If the Hand of the Infant preſents together with one or both of the Feet, the latter are notwithſtanding to be taken hold of and extracted according to the preceding Directions, gently preſſing back the Hand at the ſame time. 3. If the Hand preſents itſelf with the Nates, it is then alſo to be extracted in the ſame Method, if the Feet can be taken hold of; but if that cannot be conveniently done, the Nates may be extracted firſt, with the reſt of the Body following. 4. When one Foot is extracted, and the other cannot be found, the Buttock of the ſame Side preſenting itſelf, indicates that the Leg is bent towards the Abdomen, which if ſo, the Infant may be drawn out by one Leg. 5. If the Fœtus cannot be turned with one Leg, when the other

Rules or Directions from the preceding.

[1] Le Motte, and the reſt of the modern Writers, think this Caution uſeleſs and ridiculous; becauſe, ſay they, Twins are not included in one common, but each in its diſtinct Membrane; and therefore the Feet of one cannot be entangled with the Feet of the other: But they ought alſo to have conſidered, that the Membranes of each may be broke, and their Feet then entangled in the Birth, ſo as to render this Caution frequently, though not always, neceſſary to be obſerved.

cannot

cannot be found, that Leg is to be brought to the Mouth of the Uterus, and ſecured with a Bandage, while the other is ſearched for; which when found, the Inverſion may be ſafely performed. 6. If the Navel-ſtring appear betwixt the Legs of the Fœtus while it is extracting by the Feet, the Operator ſhould deſiſt, and draw the Navel-ſtring a little more out of the Uterus, ſo that it may make a Loop or Arch, through which the Legs are to be paſſed when bent, and after them the reſt of the Body, by which means it may be delivered without any Danger; but if, on the contrary, the Navel-ſtring is left between its Legs till the whole Infant is extracted, the Navel-ſtring may be by that means lacerated, or broke off ſo near to the Abdomen, that it cannot be afterwards tied, of which Death may be the Conſequence. 7. The Operator need not be ſollicitous about the Infant's Arms, when it is extracted by the Feet, becauſe they generally follow the Body, and if one ſhould endeavour to extract them by the Side of the Body before the Head, the Neck will by that means be compreſſed by the contracted Mouth of the Uterus, and the Head will be alſo retained in ſuch a manner, as to occaſion the Death of the Infant, if it be not prevented by ſome Artifice, which Accident does not happen when one or both of the Arms accompany the Neck. 8. When only one of the Feet preſents itſelf, as in *Fig.* 12. it is not neceſſary to return it, and invert the Head of the Infant in the room of it; but notwithſtanding the Infant ſhould not be forcibly extracted by that one Leg alone; but it is better to ſearch alſo for the other with the Hand, as in *Fig.* 12. and to draw out the Infant by both of them together; but when the other Leg is bent up towards the Abdomen, then the Infant may be ſometimes extracted by one alone, as we have before obſerved.

When the Infant's Nates preſent firſt.

XIII. When the Nates of the Infant preſent themſelves foremoſt, as in *Fig.* 4. it may indeed be ſafely delivered that Way, but not without Difficulty, eſpecially when the Paſſages are narrow; for when the Legs and Thighs are in this manner complicated with the Body, there is great Danger of the Infant's being killed by the Violence of the Compreſſion, as frequently happens when the Mother falls in Labour by herſelf, or elſe without the Aſſiſtance of a prudent Midwife, or at leaſt if the Infant be not killed, the Parts of the Mother will be lacerated, and greatly injured: And therefore if the Nates are not too far excluded to be conveniently returned, the Mother being laid down upon her Back with her Hips elevated, it may be proper to preſs them back gradually, and, proceeding from the Thigh to the Leg, to lay hold of the Foot which is neareſt, and extract it, ſearching afterwards for the other Foot, that the Infant may be delivered by both of them; but if they cannot be thus conveniently extracted together, the Infant may be delivered by one of them. However, if the Nates are ſo far excluded, that they cannot be returned, or the Foot cannot be found, it will then be neceſſary to lay hold of the two Hips with each Hand, paſſing the Fingers, eſpecially the firſt, into each Groin like a Hook, in order thereby to extract it, as at *Fig.* 4. and that without any Delay, leſt it ſhould be killed by the Compreſſure. And if the Infant in this Poſition ſhould lie with its Face upwards after its Legs have been drawn out, it ſhould be turned into a prone Poſture, except the Operator is capable of freeing the Chin and Face from the Arch of the *Os pubis* without being injured.

XIV. When

When the Head or Shoulders ſtick by the way.

XIV. When the Shoulders of the Infant are retained in the Uterus, its Head and Neck being excluded, the Buſineſs of the Midwife is then to paſs her Fingers prudently under each Arm, and, by drawing them forward, the reſt of the Body will follow without much Difficulty, eſpecially if it be drawn backward towards the Rectum, where the Angle of the *Os pubis* is largeſt, which is alſo a Circumſtance to be obſerved in moſt other Caſes; but, on the contrary, if the Fœtus preſents with its Feet foremoſt, and its Exit is obſtructed by the Arms, or Shoulders, the Fingers are to be paſſed on one Side of the Infant, and one Arm thereby cautiouſly extracted, leaving in the other, and then the reſt of the Body will eaſily follow, eſpecially if the Fœtus is in a prone Poſture, and gently turned from one Side to the other in its Extraction; the Arm left in the Uterus, is to prevent the Neck of the Infant from being too ſtrongly compreſſed by the Mouth of the Uterus, which would otherwiſe retain the Head, and ſtrangle the Infant. But it very often happens, that the Infant, which is extracted with the Feet foremoſt, if the Hand is not conveniently paſſed between its Face and the *Os pubis*, will notwithſtanding be catched by the Neck, from the Stricture of the *Os Uteri*, eſpecially when its Face and Chin lie upwards; and if one ſhould endeavour to force it out by Violence, they will ſooner pull off the Head, than accompliſh their Deſign, which they will be more likely to compleat, by paſſing the Hand over the Neck and Chin of the Infant, ſo as to prevent the Parts of its Face from catching againſt the *Os pubis*, preſſing it backwards towards the *Rectum* at the Time of its Extraction. A great many adviſe in this Poſition of the Infant, to paſs the two Fore-fingers into its Mouth, in order to draw out the Head; but as, by that means the lower Jaw may be eaſily diſlocated, broke, or pulled quite off, I think the preceding Artifice is much preferable. But if the Infant lies in a ſupine Poſture, and its Chin is reſiſted by the Arch of the *Os pubis*, ſo as not to be extricable by all the Artifices of the Midwife, in that Caſe VAN HOORN thinks the Birth will ſucceed more eaſily, if an Aſſiſtant lifts up the Feet of the Infant, while it is drawn gently forward. The ſame Author alſo obſerves, that ſometimes the Neck is twiſted by endeavouring to turn round the Fætus, when its Head is in this manner fettered; and if this be the Caſe, the Hand is to be prudently introduced to free the Parts, as we before directed; and if the Fœtus appears to be dead, it may be extracted in the ſame manner, and with leſs Caution.

Directions from the foregoing.

XV. We ſhall, for the ſake of Beginners, here relate a few more Directions, which are deduced from what we have before advanced; as, 1. When any other Part but the Head is perceived by the Touch, (the Membranes remaining entire) ſuch as the Foot, Hand, Knee, Navel-ſtring, *&c.* in that Caſe the Membranes are to be opened, either with the Fingers, Nails, or an Inſtrument, and the Feet are to be ſearched for, and the Infant thereby extracted. 2. But if the Head lies almoſt in its natural Poſition, and may be eaſily reduced to it, it may be done by the Hand, otherwiſe it muſt be extracted immediately by the Feet. 3. When the Waters are diſcharged before the Midwife is called, Search is to be made after the Poſition of the Fœtus; and if the Head preſents in its right Poſition, it may be concluded, that the Birth will ſhortly ſucceed; but if any other Part offers, it ſhould be delivered by the Feet. 4. When the Chin, and Parts of the Face, are obſtructed by the *Os pubis*, they are to be relieved

by paſſing the right Hand betwixt them, preſſing towards the Rectum, while the Paſſages are dilated, and the *Os coccyx* ſtrongly preſſed back with the left Hand. But if the Birth does not ſucceed after a ſhort Time when the Waters have been diſcharged, and the Head preſents in its natural, or any other Poſture, the Feet are then to be ſearched for, and the Infant thereby extracted, eſpecially when it is rendered ſtill more neceſſary by the urgent Pains and Throws of the Mother. 5. If the Neck or Shoulder preſents, the Head being inclined to one Side, as in *Tab.* XXXIII *Fig.* 8. if the Shoulders cannot be removed, and the Head properly diſpoſed, then alſo it is to be extracted by the Feet. 6. If the Head of the Fœtus preſents in a prone Poſture, with either of its Arms in the Vagina; in that Caſe the Midwife is to paſs one Hand over the Mouth and Chin of the Fœtus, and the other under its Arm; and thus it may be often extracted by both Hands. But, 7. if both Hands cannot be brought through the Vagina, ſhe is to endeavour to extract it by the Feet. 8. In all tranſverſe Poſitions of the Fœtus, it ſhould be extracted by the Feet. 9. When the Navel-ſtring comes out with the Head, they are both of them to be ſpeedily returned, or the Infant will periſh; but if it ſlips out again, in all Poſitions of the Fœtus, it ſhould be then extracted by the Feet without further Delay. 10. If the Fœtus preſents in its natural Poſture with the Navel-ſtring about its Neck, the Caſe is not then ſo dangerous; but it may be untwiſted, and the Fœtus afterwards extracted; otherwiſe, to prevent it from being broke, it may be cut in two near the Neck, and compreſſed by the Fingers of an Aſſiſtant till the Birth is over; when it may be ſecured with a Ligature. 11. When there are Twins, the Navel-ſtring of one is to be firſt divided, and ſecured by Ligature ſo ſoon as it is delivered, and then of the other; but if the Waters are not yet diſcharged, we are not to wait till they break forth of themſelves; for, by ſuch Delays, both the Mother and Fœtus are often in the higheſt Danger; and therefore it may be proper to divide the Membranes, and deliver the Infant, while the *Os Uteri* is relaxed, before any ſpaſmodic Contraction of the *Uterus* comes on, which might render the Delivery then impracticable.

Difficulties from the bad Diſpoſition of the Head and Uterus.

XVI. When the Vertex of the Infant's Head does not directly correſpond to the Vagina, either before or ſoon after the Diſcharge of the Waters, but is inclined to either ſide, or lies towards the *Os ſacrum*, or *Os pubis*, the Birth is then likely to be very dangerous, as we have before obſerved in § 4 & 5. If therefore the Midwife cannot conveniently reduce the Head of the Fœtus to its natural Poſition, when it is thus obliquely ſituated, and the Birth will not ſucceed, notwithſtanding her Endeavours by preſſing with one Hand upon the Abdomen of the Mother, and, by dilating the Parts, and preſſing back the *Os coccyx* with the other, the Infant ſhould then be immediately extracted by the Feet, as we have before directed; and this more eſpecially, when a violent Flooding, or excruciating Pains, with fainting Fits, ſeize the Mother.

Of the moſt difficult and dangerous Births.

XVII. Laſtly, it is not undeſervedly reckoned one of the moſt difficult Caſes, when the Head of the Fœtus deſcends ſo far into the Vagina as to be viſible, and at the ſame time is ſo ſtrongly retained, that neither the Endeavours of the Mother, nor of the Midwife, can ſet it at Liberty; for in this Caſe the moſt prudent may be deceived in their Expectations of a happy Birth, from the Child preſenting itſelf in a natural Poſition, as we have before obſerved at § 5. ſo that both the Mother and Fœtus may be loſt, if the latter be not timely extracted

tracted, either by the Hands or Inſtruments. The Cauſe of this Difficulty is commonly attributed to the Largeneſs of the Infant's Head, but generally without Reaſon; becauſe we find it has been ſmall enough to paſs through the narrow *Os Uteri*; I ſhould rather imagine it to proceed from an oblique Situation of the *Os Uteri*, or from the Reſiſtance which the Shoulders meet with againſt the *Os pubis*, when the Infant preſents ſide-ways,; which may be generally known by one of its Ears being upward, and the other downward. In this difficult Caſe there are two Methods to be followed: 1. By paſſing the two Forefingers of each Hand, at the Time when the Pains urge, in order to preſs back the Rectum and *Os coccyx*, that the Head may deſcend as low as poſſible, and then to paſs all the four Fingers of each Hand about the Head, ſo as to lay hold of it, and, by dilating the Parts, at the ſame time to free it as much as poſſible from the Stricture, till the Hands can paſs behind the Ears and Occiput, ſo as to have ſufficient Hold for extracting it: But ſometimes this alone will not be ſufficient; but it is alſo neceſſary to draw out one of the Arms, eſpecially the lowermoſt, in order thereby to extract the Fœtus, and free it from the Reſiſtance of the *Os pubis*. 2. The other Method is, when the Rectum has been preſſed back, as before, to paſs the left Hand under the Head of the Fœtus, after it has been firſt lubricated with Oil, to graſp it as a Globe, and then to paſs the Fingers of the right Hand above the Head under the *Os pubis*, endeavouring to extract it, preſſing a little backward, and adviſing the Mother to exert her Strength at the ſame time, as HOORNIUS obſerves. The Head thus extracted, the Neck of the Fœtus may be then taken hold of by one Hand, and the Head drawn forward, by moving it from one Side to the other, while the Hand, which is under the Neck of the Fœtus, extracts the neareſt Arm, and, by turning the Infant upon its Belly, drawing it gently forward at the ſame time, it comes forth almoſt of itſelf. But when all theſe Artifices prove fruitleſs, the Mother's Strength gradually decays, and her Life is threatned with the moſt malignant Symptoms, the Operator is then obliged to lay aſide Compaſſion, and extract the Fœtus, whether dead or alive, by Inſtruments, which may be done, either 1. by opening the Head with an Inciſion-knife, or Pair of Sciſſars, and extracting the Brain with the Fingers or a Scoop, after which the Head collapſing, it may be more eaſily taken hold of and extracted, either by the Hand, a Pair of large Stone Forceps, or as DEVENTER adviſes, by binding a broad Tape about its Neck behind the Head, which laſt Method, he aſſerts, will frequently ſucceed, without extracting the Brain; but if, notwithſtanding the Extraction of the Brain, it does not come forward, the Shoulders are to be freed from the *Os pubis*, and the Fœtus thereby extracted. 2. The Extraction may be made with a Hook repreſented in *Tab.* XXXIII. *Fig.* 17 & 18. in defect of which, in Caſe of Neceſſity, HOORNIUS uſes a large Nail, bent in form of a Hook, to which a Ligature is faſtened, that it may be held and drawn with more Eaſe; or, 3. it may be performed by the Inſtrument of MAURICEAU, which he deſcribes, and calls *Tire-tête*; which is, however, in my Opinion leſs commodious than the Hook of DEVENTER and HOORN. And almoſt in the ſame manner is the Fœtus to be extracted, when it cannot be delivered by the Hands in many other Caſes, which threaten the Life of the Mother, as in monſtrous Births, where there are two Heads, *&c.*

CHAP. CLIII.

Method of extracting a dead Fœtus.

Extraction of a dead Fœtus often neceſſary.

I. WHEN the Fœtus dies in the Birth, and preſents in an ill Poſture, the Diſorder which it gives the Mother, makes it altogether neceſſary to free her from it, either by the Hands or Inſtruments, nor does the Difficulty proceed altogether from the ſtill Birth, though it even be in a natural Poſition; but it proceeds in part from the Mother's Weakneſs, or from her feeling few or no Pains, from there being no motion in the Infant, whoſe Strugglings, when alive, uſually prove a ſtrong Incentive to forward the Birth; and partly alſo from the Contraction of the *Os Uteri* and *Vagina* after the Time of its Relaxation has been neglected. But before the Midwife proceeds to the Extraction, it is firſt highly neceſſary to be aſſured, whether the Infant is abſolutely dead or alive, that it may not be ignorantly killed in the Operation; and this is the more neceſſary, becauſe the generality of Signs, which are uſually propoſed to diſtinguiſh, whether it be dead or alive in the Uterus, are uncertain and fallacious, eſpecially when the Fœtus preſents either its Shoulders, Buttocks, Back, or either Side of its Head, to the *Os Uteri*; becauſe thoſe Parts afford very obſcure and uncertain Signs, whether it be alive or dead.

Signs of a dead Fœtus.

II. The principal Signs of the Fœtus being dead are the following: 1. If the Mother feels no Motion in the Fœtus ſome time after ſhe has felt her Labour-pains. 2. If ſhe is ſeized with Shiverings, fainting Fits, and a Teneſmus. 3. If her Breath ſtinks violently; and, 4. When Matter of a cadaverous Smell flows out of the Uterus. 5. The Abdomen at the ſame time ſeeming cold to the Touch. Another Sign, which is looked upon by ſome as an infallible Indication of a dead Fœtus is, when the Meconium, or black Fæces of it, are diſcharged through the Vagina; though, I muſt acknowledge, that I have frequently obſerved this laſt Appearance when the Fœtus has not been dead, and, to ſay the Truth freely, I have been induced, by all the preceding Signs, to believe the Infant dead, and to extract it as ſuch, when I have been afterwards convinced that it was alive. It is therefore, in my Opinion, a more manifeſt and certain Indication of a dead Fœtus, when the Navel-ſtring or Placenta, being touched, (when that is practicable) appear cold, and without any Pulſation of the Arteries, as alſo when there can be no Pulſe felt in the Carpus and Ancle, and eſpecially if the Cuticle eaſily peels off at the ſame time; and, laſtly, it is a pretty ſure Sign of its being dead, if no Pulſation can be felt in the Bregma or Fontanel, when it preſents in its natural Poſture, appearing rather depreſſed and flaxid, than throbbing to the Touch; however, we ſhould be cautious not immediately to imagine, that the Fœtus, which is without this Pulſation in the Fontanel and Arteries, is therefore dead; for the Motion in thoſe Parts is ſometimes ſo ſmall in weak Infants, as to be imperceptible to the Finger. Indeed the Sign taken from the peeling off of the Cuticle is more certain. If therefore the Infant appears to be really dead, and the Waters are already diſcharged, it ſhould be extracted with all poſſible Expedition, leſt, by its Putrefaction in the Womb, it might occaſion a moſt malignant Fever, and even the Death of the Mother: But if the Fœtus dies before its true Time of Birth, the Waters not being

being diſcharged, it may, in that Caſe, remain in the Uterus without putrifying for the ſpace of ſeveral Weeks, or even Months, of which I had formerly an Inſtance [a]; and therefore, in that Caſe, it may be better to wait till we have ſome Call from Nature, rather than to procure an untimely Excluſion of it, either by Medicines, the Hands, or Inſtruments.

When the dead Fœtus preſents itſelf rightly.

III. If the Infant dies in the Birth, and at the ſame Time preſents in a natural Poſition, we are not immediately to fall to work upon it with Inſtruments, before we are certain of its Deceaſe; but the Mother ſhould be aſſiſted in her Endeavours, to exclude it naturally by proper Medicines, particularly ſtrong Glyſters, which are frequently very ſerviceable in promoting the Throws of the Mother, and the Excluſion of the Fœtus; and, if they prove inſufficient, it may be extracted by the Hands [b] before it begins to putrify. That the Operator may then ſucceed the better, the Mother ſhould firſt void her Urine as if the Fœtus was alive; but if ſhe cannot of herſelf make water, becauſe the Head of the Infant compreſſes the Neck of her Bladder, it ſhould then be drawn off by the Catheter repreſented in *Tab.* XXVII. *Fig.* 1, 5, which done, ſhe may be placed either in the Chair, *Tab.* XXXIII. *Fig.* 15. or elſe upon a Bed, as we have before directed in § 4 & 10 of the preceding Chapter, after which the Infant is to be extracted, by applying both Hands to its Head, or elſe by the Feet, as we have deſcribed in the foregoing Chapter. It may be alſo not amiſs to attempt its Extraction by paſſing a broad Ligature about its Neck, as DEVENTER adviſes before the Application of Hooks, which are leſs ſafe. The Hooks proper for this purpoſe ſhould be well poliſhed; Figures of which have been given by ſeveral Authors, and may be ſeen in *Tab.* XXXIII. *Fig.* 17, 18, & 22. theſe are to be prudently faſtened into ſome convenient Part of the Infant's Head, as the Eye, Ear, Mouth, and ſometimes the Forehead and Occiput together, thereby extracting the Fœtus downward againſt the Rectum; and, if thoſe Inſtruments are not at hand, a large Nail may be bent into a Hook, and applied as we obſerved in Sect. XVII. of the preceding Chapter. But CELSUS, who, in my Opinion, ſeems to have been well verſed in theſe Matters, prudently adviſes not to extract the Fœtus at any time indiſcriminately; for, ſays he, "if it be attempted when the Parts are contracted ſo "as not to give way to the Fœtus, the latter will be not only pulled to pie-"ces, but the Parts themſelves will be alſo injured by the Point of the Hook; "and therefore when the Parts are contracted, that is, when the Pains ceaſe, the "Operator ſhould deſiſt, and repeat his Extraction when they come on again. Laſtly, CELSUS directs the Hook to be drawn with the right Hand, while the left guides it, and holds the Fœtus. But if the Infant's Head is ſo large, or obliquely ſituated, that it cannot be drawn through the Vagina whole, an opening may then be made in the Fontanel, or other Part of the Head, and the Brain thereby extracted, that the remaining Parts may collapſe, and be more eaſily extracted by one or both Hands. The celebrated Profeſſor of Midwifery, MAU-

[a] I remember a Caſe of this Nature, in which the Mother retained a dead Fœtus for two whole Months without any Detriment, till at length ſhe fell in Labour, and diſcharged her Burthen without any Difficulty. More ſuch Inſtances occur in Authors.

[b] That this is one of the moſt ancient Operations, may appear from HIPPOCRATES's Book, *de Morb. Mulier.* and eſpecially from his profeſſed Treatiſe *de Fœtus Extractione.* See FONTANI *Libellus de Fœtus Extractione* per Uncum.

RICBAU, in his Treatiſe upon that Subject, furniſhes us with a particular Inſtrument both for opening and holding the Head, which he calls *Tire-tête*, and highly extolls it, as having frequently experienced the Advantage of it; but this complex Inſtrument is, in my Opinion, not ſo very neceſſary, as the Buſineſs may be eaſily performed by the ſimple Hooks repreſented *Fig.* 17 & 18. or elſe when the Brain is extracted, it may be very well drawn out, even by a crooked Nail, or the Hand only.

When the dead Fœtus lies in an unnatural Poſture.

IV. But if the dead Fœtus preſents in an unnatural Poſition, we are then to turn it, and extract it by the Feet, as CELSUS has adviſed; and this much in the ſame manner as we have before directed for unnatural Poſtures of the live Infant; but with a little more Caution, eſpecially if the Fœtus is begun to putrify, leſt it ſhould be pulled to pieces, and the Head left behind in the Uterus, which cannot then be eaſily extracted, becauſe the *Os Uteri* contracts itſelf, ſo that by its being retained, and putrified in the Uterus, it excites the moſt malignant Symptoms, and frequently even kills the Mother, if it be not ſpeedily extracted.

When the Head is left behind after extracting the Body.

V. As the Head is not eaſily extracted, both upon the Account of its round Figure and Lubricity ſlipping through the Fingers, it may be adviſeable, when the Head is thus left behind, to attempt its Extraction by thruſting the Finger into the Mouth, or the *Foramen magnum* of the *Os occipitale*; by which means I myſelf happily extracted the Head of an Infant without Inſtruments. But if the Fingers are not ſufficient for this Office, a Piece of Linen may be paſſed into the Uterus, being about an Ell long, and four Fingers Breadth, which being paſſed round the Head, and faſtened into a Loop for the Hand, the Extraction may be thereby made very commodiouſly; others recommend an Inſtrument for this purpoſe, which is to be fixed into the Mouth, Noſe, Occiput, or other Part paſſing the left Hand into the Vagina to guide the Hook, and to prevent it from injuring the Parts, as we before obſerved from CELSUS in Sect. III. But notwithſtanding, if it proves too large to be drawn out by theſe means, it may be then opened, the Brain extracted, and the remainder performed either by the Hands alone or proper Inſtruments. The celebrated AMYAND in this Caſe uſes a kind of Net or Bag, in which he includes the Head, and afterwards extracts it without injuring the Parts by Inſtruments. But this ſeems to me more difficult, or leſs practicable than the preceding Methods.

The Arm hanging out of the Uterus.

VI. Sometimes the Arm of the dead Fœtus hangs out of the Uterus in ſuch a manner, that it neither can, nor ought to be returned; but when it affords the certain Signs of Death, by appearing black or livid, cold and without Pulſe, the Cuticle ſeparating as we before obſerved, the Midwife is then to endeavour to turn the Feet, and thereby extract it as if it were alive; but if, from the Largeneſs of the Arm, or the too great Stricture of the Uterus, her Hand cannot be paſſed, which ſeldom happens, it will then be neceſſary either to twiſt or cut off the Infant's Arm near the Shoulder; but before it is cut off by the Knife, it will be more convenient to twiſt and extend the Arm ſeveral Times one Way; by which means the Ligaments, being partly extended and partly lacerated, may be more eaſily and ſecurely cut through; but, to prevent the Point of the Knife from injuring the Mother, it will be proper to uſe the Scalpel armed with a Button, repreſented in *Tab.* V. *Fig.* 4 & 5. which I have ſometimes

times uſed with Succeſs, and, when the Infant's Arm has been thereby removed, the Hand may be then paſſed to turn and extract it by the Feet.

VII. Sometimes the Shoulders are held ſo faſt in the Neck of the Uterus, either by its Contraction or the croſs Poſition of the Fætus, that the Hand can neither paſs, nor alter the Poſition thereof without Danger of lacerating the Uterus [c], by exerting too great a Force; in which Caſe there is no Poſſibility of laying hold of the Feet by the Hand: I therefore here think it adviſeable with Celsus, to open [d] the Thorax and Abdomen of the Infant, either with the Finger, Sciſſars, or a Hook, *Tab.* XXXIII. *Fig.* 17 & 18. and, after extracting the Viſcera and Inteſtines, to try if the Feet cannot, by this Diminution, be more eaſily come at, and the Fœtus thereby extracted, which has generally ſucceeded with me when I have tried this Method; but if notwithſtanding the Parts remain contracted, and the Feet concealed, or out of reach, then the Nates are to be extracted by paſſing the Hand under them, and the Hook into their upper Part, after which the Trunk and Head will follow of themſelves; but frequently not without leaving ſome Parts behind [e]. But, to avoid injuring the Uterus, in introducing the Hook for this purpoſe, it may be proper to have its Handle made with Notches, as in *Tab.* XXXIII. *Fig.* 19. that, by feeling with the Finger, we may be able to judge of the Poſition in which the Inſtrument is to be directed in the Uterus, ſo as to enter the Fœtus without injuring any other Part; without which Precaution both the Bladder and Uterus have been very often dangerouſly wounded, which might have been avoided by this Artifice, as I have frequently myſelf experienced. Another Advantage in the Handle of this Inſtrument is, that when one of my Hands proves not ſtrong enough to make the Extraction, the other Hand, being engaged with the Fætus in Utero. I then faſten a ſtrong Ligature about the Neck of it, marked *b b*, whereby the Midwife, or any other Aſſiſtant, may alſo draw while my own Hand guides, and partly alſo extracts the Handle, which is an Advantage not to be found in common cylindrical Handles.

The Uſe of Hooks, eſpecially of my own.

VIII. They alſo act with Reaſon, in my Opinion, who prefer and uſe the large Forceps, which we have before deſcribed in *Tab.* XXVIII. for extracting the Stone, as much better than any Hooks, or other Inſtruments, not only be-

Uſe of the Forceps.

[c] That the Uterus may be ſometimes burſt in the Delivery, I am convinced from the Experience of myſelf, and the Obſervations of others; ſee Stalpart Vander Wiel *Obſ. &c.* and our Diſſertation *de Fœtu ex Utero matris mature excidendo.*

[d] There are indeed ſome, who boaſt they can always deliver the Fœtus without the Uſe of Inſtruments, and alſo reflect with Severity upon thoſe, who, in difficult Caſes, apply them; ſuch are chiefly Viardelius, Deventer, and Le Motte; when, at the ſame Time, we find Inſtances in the Treatiſes of the two laſt, where they were obliged to have recourſe to Inſtruments when both their Hands were inſufficient.

[e] Viardelius, who endeavours to diſcard or reject the Uſe of Inſtruments for extracting a dead Fœtus, in Confirmation of his Doctrine, alledges a Caſe, wherein the Head of a dead Fœtus ſtuck ſo faſt in the Vagina, as to put him to the greateſt Difficulties, which however he at laſt extracted, after an Hour's Fatigue, with both his Hands: But the Conſequence was, that the Mother died ſoon after with a Mortification of the Parts; whereas if a proper Hook had been timely and ſkilfully fixed in the Head, or its Brains ſcooped out, it might then have been extracted in a few Minutes, with Eaſe both to the Patient and Operator, and the Mother poſſibly by that means preſerved from the bad Effects which muſt neceſſarily follow from the Contuſion, or Violence and Injuries offered to the Parts by the Hands, which are much too bulky, conſidering the ſmall Capacity and Stricture of the Parts.

cauſe

cauſe they are leſs apt to injure the Uterus, but alſo as they may be more eaſily held in the Hand of the Surgeon; though at the ſame Time there is no leſs Caution neceſſary in the Uſe of theſe, than of other Inſtruments, in order to avoid pinching and lacerating the Mouth, or any other Part of the Uterus.

HOORN's Method of Extraction.

IX. HOORNIUS has ſtill another ſhorter Method of his own for extracting the dead Fœtus when its Arm is fettered in the Vagina, which conſiſts in dividing the Neck from the reſt of the Body either with a Hook or Scalpel, when there is not Room enough for the Hand to paſs to its Feet, after which the Fœtus comes forth with little or no Trouble, the Operator drawing it only by the Hand, and the Head may then be afterwards extracted, either by the Hand alone, or the Artifices before propoſed; agreeable to which we find CELSUS directing the ſame Method in the ſame Caſe, where he ſays, "when the Fœtus "preſents in a tranſverſe Poſture (much in the manner as in *Tab.* XXXIII. *Fig.* 8.) "the Remedy is then to cut off the Neck, that the Parts may be extracted ſeparately.

A Caution concerning the Uſe of Inſtruments.

X. Though I am not altogether againſt the Uſe of Inſtruments when really neceſſary, yet I would not adviſe them but in deſperate Caſes, where there are no Hopes left of a Delivery by the Hand and Medicines; and therefore every prudent Midwife ought to be well aſſured, that the Infant is dead before any Inſtruments are applied, otherwiſe it would be reaſonably deemed a raſh Action in any Operator to extract the Fœtus, by pulling it to pieces before it is dead, except there be ſome particular and important Reaſons, as when the Mother's Life is in the utmoſt Danger, and will be inevitably loſt through Weakneſs, if the Birth be delayed any longer; in which Caſe I muſt needs think it may be done with a ſafe Conſcience [f], as well as with the Conſent of the moſt learned Prelates of the *Lutheran* Church, notwithſtanding the Doctors of the Church of *Rome* will not allow of it, as we before obſerved in our Chapter upon the *Cæſarean* Section. Though the moſt experienced Surgeons have been ſometimes miſtaken, and extracted the Fœtus either alive, or not quite dead, when themſelves, the Mother, and Aſſiſtants, all of them believed it had expired; which ought to be no wonder, ſince CELSUS reckons the Buſineſs of delivering the Infant from the Womb to be one of the moſt intricate, dangerous, and difficult Operations, requiring the greateſt Judgment and Caution. However, when the Fœtus appears to be alive, and the Mother's Strength ſtill continues, no Inſtrument ſhould be paſſed to extract it: And as for the *Specula Uteri* propoſed and deſcribed by ALBUCASIS, SCULTETUS, MAURICEAU, and others, I am ſo far from thinking them uſeful and neceſſary, that I muſt rather, with many of our modern Phyſicians and Surgeons, judge them to be pernicious, and apt to injure the Parts.

[f] See *Chap.* CXIII. preceding on the *Cæſarean* Section.

CHAP.

CHAP. CLIV.

Of profuſe Hæmorrhages *or Floodings of the* Uterus *in Women with Child.*

I. SOMETIMES Women with Child, eſpecially thoſe who are near their Time, have a more or leſs copious Diſcharge of Blood from the Uterus, which is different from the Menſes, becauſe it happens in Women who are pregnant. Sometimes this Flux proceeds, eſpecially in the firſt Months, from the Patients being too full of Blood, the Redundancy of which is evacuated by a Rupture of the Blood-veſſels of the Vagina and Uterus; but very often in the laſt Months the Hæmorrhage proceeds from a total or partial Separation of the Placenta, occaſioned by ſome external Violence, as a Fall, Leap, Blow, *&c.* or from too great a redundancy of Blood, to which ſome of the Moderns add an Adheſion of the Placenta to the Mouth of the Uterus, which ſeparates when that Part relaxes itſelf at the Time of Delivery, ſo that the more the *Os Uteri* is dilated, the greater Separation is made of the Placenta; and conſequently a greater Hæmorrhage follows, which is ſometimes ſo profuſe as greatlyto weaken the Mother, if not to endanger her Life, and if the Fœtus be not timely extracted with the Hand before fainting Fits, *&c.* come on, both it and the Mother cannot long ſurvive [a]. Cauſe of the Diſorder.

II. This Diſorder is ſufficiently apparent from the Relation of the Mother, and from inſpecting the Flux of Blood this way diſcharged; but whether it proceeds from the Vagina only, or from the Uterus, cannot well be determined but by ſearching with the Finger up to the *Os Uteri*; for if, upon paſſing theFinger into the Vagina, the *Os Uteri* is found ſhut, the Flux then proceeds from the Vagina only, and the Quantity diſcharged is uſually not immoderate; but if, on the contrary, the Hæmorrhage is profuſe, the *Os Uteri* appears relaxed, and the Finger perceives the ſpongy Subſtance of the Placenta inſtead of the Infant's Head, it then denotes, that the Flux proceeds from the Uterus by a Separation of the Placenta, which is a Caſe much more dangerous than the former. The larger the Hæmorrhage, the more dangerous, and, if ſpeedy Aſſiſtance be not given to the Mother and Infant, when fainting Fits approach, the Lives of both are in the utmoſt Danger; but if the Mother's Hands are cold, and her Eyes look dim, her Pulſe becomes weak, attended with a cold Sweat and Convulſions, which are the uſual Conſequences of a very profuſe Bleeding, we may then reaſonably conclude there are no Hopes, but Death is at hand; and that therefore it is better for the Operator to do nothing, leſt he ſhould be cenſured by the ignorant, as being acceſſary to her Death. Diagnoſis and Prognoſis.

III. When this Diſorder proceeds from too great Fulneſs, violent Heat, or Commotion of the Blood, it may be generally remedied by Bleeding in Treatment.

[a] See BRUNNERI *Diſſ. de Part. p. n. ob ſitum placentæ ſuper orificium internum Uteri*, Argentorat. 1730. and STUART's Diſſ. *de Secundinis*, Anno 1737. There was a Woman ſome Years ago near her Time at *Helmſtadt*, who was taken with a profuſe Bleeding from her Womb, without any manifeſt Cauſe, of which ſhe expired in an Hour's Time, notwithſtanding ſhe had the immediate Aſſiſtance of an expert Midwife. But the Huſband, not permitting me to open her, I could not diſcover the Cauſe.

the Arm, exhibiting cooling and aſtringent Medicines, and recommending the Patient to a proper Diet and Reſt both of Body and Mind. But if the Flux is very large, proceeding from the Uterus itſelf, and not yielding to the means before propoſed in that Caſe, the Separation of the Placenta uſually occaſions it; and there is no other Remedy left but to extract the Fœtus and Secundines with the Hand, beauſe the ruptured Veſſels of the Uterus cannot contract themſelves ſo long as they are diſtended by the Fœtus, and its Appendages; and therefore Medicines proving uſeleſs, the only Remedy is a dextrous Extraction of the Fœtus with the Hand in the following manner:

Manner of extracting the Fœtus.

IV. In the firſt Place, the Mother is to be laid in a convenient Poſture upon a Bed with her Hips elevated, her Legs opened, *&c.* as we have before directed in difficult Labours; which done, the Operator then paſſes his Hand, lubricated with Oil or Butter, through the Vagina to the *Os Uteri*, which, if not ſufficiently open of itſelf, he may then moderately dilate it with one, two, or more of his Fingers, till it will admit his whole Hand, which cannot eaſily be done, when the Placenta adheres to this Part, in which Caſe the Operator muſt gently ſeparate it with his Fingers, where it adheres with the leaſt Force, obſerving not to ſeparate more of the Placenta than will make way for his Hand, to avoid a more profuſe Hæmorrhage, and the Death of the Patient. If the Placenta obſtructs the *Os Uteri* after it has been ſeparated, in that Caſe Hoornius extracts it firſt, and the Fœtus afterwards; for in this Caſe there ought not to be any Delays; and therefore the Hand is to be immediately paſſed into the Uterus, to extract the Infant by its Feet, in order to preſerve the Mother, though perhaps the former is immature. But as the Membranes of the Fœtus remain ſometimes entire, in order to lay hold of the Infant's Feet, they may be divided by the Finger-nails, or a Hook, as we obſerved in the preceding Chapter: After which all Endeavours are to be uſed to ſearch for, and extract the Fœtus; which done, the Secundines uſually follow of themſelves, as being in this Caſe already ſeparated from the Uterus, and, if there ſhould remain any Adheſions, they are to be gently freed with the Hand before the Extraction; which being performed, and the concreted Blood drawn out, to prevent it from occaſioning any After-pains, the Veſſels will contract themſelves, and the Flux of Blood gradually diminiſh, eſpecially with the Aſſiſtance of proper external and internal Medicines, and Reſt. In the mean time, the Patient being greatly weakened by ſo conſiderable a Loſs of Blood, ſhe ſhould be treated with a reſtorative Diet and Medicines, as we before directed in violent Hæmorrhages, particularly warm Suppings, as Broth, Milk, Jellies, Almond-emulſion, and the common Ale-cordial; and if, by this means, the Mother ſurvives ſix Hours after, ſhe generally recovers; the Hæmorrhage ceaſes, and ſhe regains new Strength from thoſe thin Aliments; ſo that, in Caſes of this Nature, the Extraction of the Fœtus ſhould not be deferred till the Mother falls into Fainting-fits; for, by ſuch Neglect, I have known many who have periſhed in the Flower of their Age; and, for Examples, the Reader may conſult Mauriceau *Obſ.* 89. and his Index under the Title of our preſent Subject.

CHAP.

CHAP. CLV.

The Method of extracting the Secundines.

I. THE After-burthen, or Secundines, was ſo termed by the Ancients, as coming in the ſecond Place after the Fœtus, theſe are the Navel-ſtring, Placenta, and Membranes including the Fœtus, *viz.* the Chorion and Amnios, which are generally excluded together, I ſay generally, becauſe ſometimes a part of the Membranes adheres to the Uterus after the Placenta has been extracted, and, by putrifying there, excites malignant Symptoms. The Secundines generally ſeparate from the Womb ſpontaneouſly after the Infant has been delivered, or at leaſt they are uſually freed and excluded by the Aſſiſtance of the Mother's Throws; however, if they ſhould adhere to, and remain in the Uterus after the Birth, either from their Largeneſs, a Laceration of the Navel-ſtring, or a too ſtrict Coheſion, it will then be proper to ſeparate and extract them with the Hand, leſt the *Os Uteri* ſhould contract and retain them, and, by putrifying in the Womb, they might occaſion moſt malignant Fevers, Pains, profuſe Bleeding, and even Death itſelf [a]. I am not indeed ignorant, that it is the Opinion of many, the Secundines need never be extracted with the Hand, becauſe they generally ſeparate either of their own accord, or putrify, and come away after a few Days or Weeks [b]; but I think their Opinion the ſafeſt, who approve of timely extracting them with the Hand, when they do not immediately follow the Infant, as is adviſed by HIPPOCRATES, CELSUS, and the major Part of our modern Phyſicians; and this the rather, becauſe we are furniſhed with many Inſtances of dreadful Symptoms which have followed a Neglect hereof, ſuch as violent Pains, Floodings, malignant Fevers and Death itſelf. It is therefore moſt adviſeable to extract them as ſoon as poſſible immediately after the Birth of the Infant, while the *Os Uteri* remains open, and freely admits the right Hand, which is to be guided by the Navel-ſtring held in the left till it arrives at the Placenta, which is to be gently freed from the Uterus by the Fingers, and then extracted [c]; but if it adheres more ſtrongly than uſual, it will be neceſſary to tie the Navel-ſtring, and cut it off near the Infant, and, winding it round the Fingers of the left Hand, to pull it moderately in various Directions, while the right Hand is freeing it from the Womb, as we have repreſented in *Tab.* XXXIII. *Fig.* 9. but if all this is not ſufficient, it may be proper to rub the Patient's Abdomen with one Hand, or to direct another to do it, adviſing the Mother to cough and ſtrain, in order to promote its Excluſion, which ſeldom reſiſts theſe means; but Care ſhould be taken not to draw the Navel-ſtring and Placenta too violently, for fear of inverting the Uterus, which has been done by ſome ignorant Midwives, to the Hazard of the Patient's

When their Separation is eaſy.

[a] As hath been obſerved by TULPIUS *Lib.* 4. *Obſ.* 42. MAURICEAU *in Obſ.* & COHAUSEN *Lucina Ruyſchiana*, where there are many Inſtances collected together from Writers.

[b] This Opinion was countenanced by RUYSCH towards the latter Part of his Life, in a Treatiſe at *Amſterdam, de Uteri Placenta*, Ann. 1725.

[c] There are ſome who affirm, the Ancients were ignorant of this Method of extracting the *Secundines*; but whoever peruſes *Lib.* VII. *Cap.* 29. of CELSUS, will perceive, that he was both well acquainted therewith, and has alſo given us an accurate Deſcription of the ſame.

Life[d]. Laſtly, when the Placenta has been thus extracted, it may be proper, as CELSUS adviſes, to paſs the Hand again into the Uterus, in order to free it from the grumous Blood, or any pieces of the Secundines, which may be left behind, and might prove the Cauſe of violent Pains, Floodings, &c. It may be alſo not amiſs to continue the Hand doubled in the Uterus for ſome Time, that it may more equally contract itſelf, whereby many bad Symptoms may be prevented.

When the Secundines adhere firmly.

II. If the Placenta ſhould adhere ſo ſtrongly as not to give way to the ſeveral means before propoſed, it will be neceſſary to ſeparate it gradually with the Fingers from the Uterus, which may be generally done without any great Difficulty, when any Part of it is looſened, and the Thumb being applied in its Center, the Fingers are extended to its Sides, and gradually inſinuate between it and the Uterus: But if it will not eaſily ſeparate in this manner, we are notwithſtanding to endeavour at it, eſpecially with the Thumb and two firſt Fingers, and, if they fail, it may be bored through in its middle by the Fingers, and by that means ſeparated, but with Caution, to avoid injuring the Uterus by the Finger-Nails, or any Violence, which might invert it; for, it is certain, there are many Caſes in which the Placenta adheres ſo firmly to the Uterus, that it cannot be extracted without a conſiderable Force, as I have myſelf experienced, and PAREUS mentions a Caſe in which the Placenta could not be extracted by any Art: In many of which Caſes a violent Separation of the Placenta frequently proves fatal to the Mother, according to the Obſervation of various Writers. If therefore the Placenta will not give way but to great Violence by the Hand, it is better to deſiſt, and make Trial of forcing Medicines, which I have frequently known to ſucceed, particularly the *Pulv. ex arefacto Anguillæ hepate unà cum Bile, vel ex Mar. Borac, cum Aq. paleg. & Cinnam. Pil. Aloet*, &c. to which we may add a ſtimulating Clyſter, and Suppoſitory with ſternutatory Powders, which are adviſed by HIPPOCRATES, it being better to commit the Buſineſs to Nature, aſſiſted by theſe Remedies, than violently to ſeparate or lacerate the Placenta from the Uterus by the Hand, which may be attended with the moſt malignant Symptoms and Death itſelf, as we are aſſured by many Obſervations. The like Caution ſhould be alſo uſed by the Surgeon, not to force his Hand violently into the Uterus, when its Mouth is contracted from his having been called too late.

Method of Extraction when the Navel-ſtring is broke.

III. If the Navel-ſtring ſhould be broke, either through the Imprudence of the Midwife, its own Weakneſs, a Putrefaction, or any other Cauſe, it is then very difficult to lay hold of, and extract the Placenta by the Hand, for want of the String which ſhould be its Guide, ſo that thoſe who are not well verſed in theſe Matters may miſtake, and injure the Uterus, inſtead of the Placenta, which ought therefore to be carefully diſtinguiſhed from each other. If a ſmall Part of the Navel-ſtring ſhould yet adhere to the Placenta, its Extraction may be thereby attempted, and often performed with leſs Difficulty; but when it is broke cloſe off from the Placenta, the latter ſhould be well di-

[d] Many adviſe only to draw the Navel-ſtring 'till the *Placenta* follows, which is a Method very hazardous, to riſque the breaking of the Cord, whereby the Extraction would be rendered much more difficult; and therefore it is more adviſeable to paſs the Hand thereby to the *Placenta* itſelf.

ſtinguiſhed

ſtinguiſhed from the Uterus by its vaſcular Texture and Inequality, which may be perceived by the Fingers, as repreſented in *Tab.* XXXIII. *Fig.* 13. After which the Surgeon is gently to looſen, and ſeparate it from the Uterus with one Hand, while, with the other, he preſſes upon the Abdomen of the Patient, oppoſite to the Placenta, or elſe directs an Aſſiſtant to do the ſame. Laſtly, we are here to obſerve, that DEVENTER, and ſome others, affirm, that the Placenta always adheres to the Fundus of the Uterus, in which Part it therefore ought always to be ſearched for; but DE GRAAF, VAN HOORN, STEVOGTIUS, BRUNERUS, myſelf, and others, have both aſſerted, and experienced the contrary; for ſometimes it does not adhere to the Fundus, but to the Sides of the Uterus, or to its anteriour Part, from whence it ſhould be gently ſeparated and extracted, as before, and, when extracted, a ſtrict Enquiry ſhould be always made, whether it be entire or whole, that, if not, the Remainder may be afterwards ſearched for, and extracted together with the grumous Blood.

IV. I cannot, in this Place, omit the Opinion of the celebrated RUYSCH, who has publiſhed a profeſſed Diſſertation upon our preſent Subject, in which he attributes a kind of orbicular Muſcle to the *Fundus Uteri*, whoſe Office is to exclude the Placenta, which Muſcle can generally perform its Office without the Aſſiſtance of Art; ſo that if the Placenta does not eaſily follow the Hand, by gently drawing, he thinks it adviſeable to leave it to Nature and the Action of this Muſcle; and the rather, becauſe himſelf, being a Phyſician of ample Experience, and ninety Years old, had always found, that ſeparating the Placenta by the Hands, not only occaſioned the moſt malignant Symptoms, but alſo frequently the Death of the Mother; whereas thoſe in whom this Buſineſs had been left to Nature, generally recovered, the Expulſion being happily effected by Nature only; he therefore lays it down as a neceſſary Caution, never too raſhly to introduce the Hand into the Uterus, and forcibly ſeparate the Placenta. Though I do not altogether diſſent from the Opinion of this celebrated Phyſician; yet I muſt own, in Conjunction with many others, that we are furniſhed with not a few Inſtances, where the Mother has expired [a] from a Retention of the After-burthen; and therefore I am firmly perſwaded, that RUYSCH does not intend to forbid an Extraction of the Secundines in all Caſes, but only where it cannot be performed but with Violence, which is alſo apparent from his *Adverſ. Anatom. Dec.* 2. I muſt therefore give it as my Advice, never to leave the Secundines in the Uterus, nor commit their Excluſion to Nature when they may be ſeparated and extracted without Violence; but if they require an uncommon Force, or the Mother is convulſed, it is then adviſeable to defer the Operation, and aſſiſt the Mother with proper Medicines, as we have before directed, whereby they are frequently excluded without the Aſſiſtance of the Hand. [b].

RUYSCH's Opinion on this Head.

V. If the Midwife ſhould perceive, that there ſtill remains one or more Infants in the Womb after the Excluſion of the firſt, ſhe ſhould take great Care not to extract any of the Secundines of the firſt Fœtus before each of them are

If there are Twins.

[a] For Inſtances of which, the Reader may conſult LEPORINUS *de Secundinis.* COHAUSEN *in Lucina Ruyſchiana.*

[b] As it is obſerved by HIPPOCRAT. *de Morb. Mulier.* Lib. I. AETIUS *Tetrabibli,* Lib. IV. Serm. 4. C. 24. AEGINETA Lib. VI. Cap. 75. PAREY *Lib. de Generat.* Cap. 18 BARTHOLIN, SOLINGEN, MAURICEAU, RUYSCH, and many more of the Moderns.

deli-

delivered, otherwiſe it might occaſion an Hæmorrhage fatal both to the Mother and the other Infants. If the Secundines ſhould appear to be already putrified from neglecting to extract them, in that Caſe great Care ſhould be taken to prevent the Uterus itſelf from mortifying, in order to which if the corrupted Parts cannot be extracted by the Hand and Fingers, they may be brought away by injecting with a Syringe ſome vulnerary Decoction, *ex fol Agrimon. Scord. Abſinth. cum Mel. Roſar. Elix. propriet.* &c. This Decoction may be injected ſeveral times every Day by the Syringe repreſented in *Tab.* VI. *Fig.* 12, & 13. till all the foreign and corrupted Parts are waſhed away, at the ſame Time not neglecting the Uſe of internal Medicines proper for expelling the Secundines, together with ſtimulating Clyſters.

When retained in ſome Cell of the Uterus.

VI. If the Placenta ſhould be retained in the Uterus as in a Bag, from a ſpaſmodic Contraction of its Mouth, ſo as to make the Operator imagine it to be abſent, of which we have ſome Inſtances given us by the Moderns, the Caſe is then not without Difficulty; however, in order to extract the impriſoned Secundines, the Hand is to be guided by the Navel-ſtring to the *Os Uteri*, which is then to be gradually dilated, firſt by one, and then by inſerting the reſt of the Fingers, till the whole Hand is introduced, whereby the Placenta may be laid hold of, and extracted. If the Reader is deſirous of more upon this Head, among others, he may conſult MAURICEAU *Lib.* 2. *Cap.* 9. LE MOTTE in his *Obſ. Cohauſen in Lucina Ruyſchiana*, &c.

An EXPLANATION *of the* THIRTY-THIRD PLATE.

Fig. 1. Shews the Method of examining the State of the *Os Uteri* with one or two of the Fingers, to diſcern whether it be dilated, contracted, or in an oblique or ſtraight Direction; from whence the Operator may form a Judgment concerning the Delivery, whether it will come preſently, eaſily, or difficultly, *&c.* A denotes the Uterus, BB the Vagina laid open, CC the *Os Uteri internum*, as yet contracted, but in its right Situation, D repreſents the manner of examining the *Os Uteri* with one or more of the Fingers, which, if obliquely ſituated either forwards toward the *Os pubis*, backwards on the *Os ſacrum*, or towards either Side, denotes a difficult Delivery.

Fig. 2. Repreſents the natural Poſture of the Infant in the Birth, with its Head protruding into the *Os Uteri*, under the Arch of the *Oſſa pubis*, A the Infant, BB the Womb laid open, CC the *Oſſa pubis*, DD the *Oſſa Iſchii*, EE the *Oſſa Ilei*, F. the Navel-ſtring, G the Secundines adhering to the Womb.

Fig. 3. An Infant preſenting with its Feet foremoſt.

Fig. 4. Shews the Nates offering themſelves, and the Method of forwarding the Birth by applying the Hands to extract them.

Fig. 5. Repreſents the Fœtus in a tranverſe Poſition, with the Hand of the Operator endeavouring to turn it.

Fig. 6. Shews the manner of apprehending the Infant's Feet, turning and extracting them.

Fig. 7. Shews the Infant in a tranſverſe Poſition, with its Abdomen towards the *Os Uteri* and Vagina; in which Poſture the Navel-ſtring often comes out, to the Hazard of the Infant's Life.

Fig.

Fig. 1.

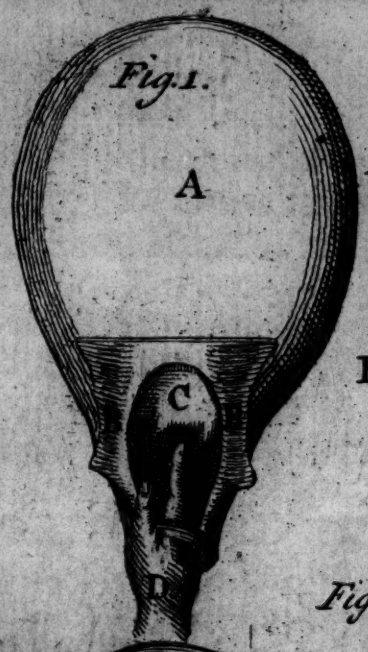


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

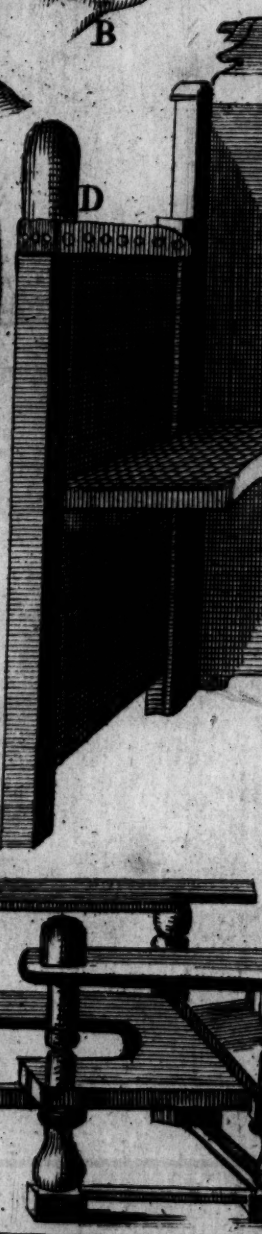


Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

E

C C

D

A

Fig. 13.

Fig. 14.

A

D

C

A

B

Fig. 15.

Fig. 16.

A B

Fig. 17.

B

A

Fig. 18.

Fig. 20.

Fig. 21.

Fig. 19.

a
a
a
a
a

b b

Fig. 8. Repreſents the Head obſtructed by the left Side of the *Pelvis*, and the Neck being ſtrongly compreſſed by the Contraction of the Uterus, renders the Birth extremely difficult, or impracticable.

Fig. 9. Shews the Infant's Head inclined towards the right Side of the *Pelvis*, with the manner of replacing it by the Hand, when the Waters have been lately diſcharged.

Fig. 10. Shews the Infant preſenting its Elbow or Shoulder to the *Os Uteri*, with the manner of apprehending the Feet, in order to turn and extract them in this, and other unnatural Poſtures.

Fig. 11. Denotes the manner of paſſing up the Hand, in order to turn and extract the Infant by its Feet, when its Hand and Arm hang out of the Womb.

Fig. 12. Shews the Infant with one Foot out, and the manner of inveſtigating the other for its Extraction.

Fig. 13. Exhibits the Method of ſeparating and extracting the Placenta from the Womb, when it does not eaſily follow the Infant. There the Navel-ſtring AA is held by the left Hand B, while the right Hand D, is thereby guided in the collapſed Uterus CC, to the Placenta E, which is hereby ſeparated from the Uterus.

Fig. 14. Repreſents a Chair frequently uſed among us for delivering Women, AA its Back, BB the Sides, C the Seat, having a ſemicircular Piece cut out in the middle, that the *Os coccyx* may bend back, and the Fœtus have room to paſs out, DD the two Handles which are graſped by the Patient in each Hand.

Fig. 15. Is another Chair for the ſame Uſe, with a flexible Back, that if the Birth ſhould be preternatural, it may be let down, and the Patient inclined on it as if upon a Bed, to facilitate the Delivery; but, in Defect of this Chair, a common Bed or Table may ſuffice.

Fig 16. Gives an Idea of the broad Steel-hooks of PALFYNUS, for extracting a Live-infant without Injury, when its Head ſticks in the Vagina; but their true Size is as large again as the Figure. It is neceſſary to have two of them, that one may be applied to each Side of the Head.

Fig. 17, & 18. Repreſent a lateral View of the Hooks, which I generally uſe uſe when there is Occaſion for extracting a Fœtus. A their Points, BB their Backs.

Fig. 19. The Handle of theſe Hooks with Notches *aaaaa*, in that Part which correſponds to the Back of the Inſtrument, that, by feeling with my Thumb, I can tell how the Hook is directed out of Sight in the Womb, ſo as to avoid injuring it. And in the Groove *bb* a Ligature may be faſtened, by which the Extraction may be alſo forwarded by ſome Aſſiſtant.

Fig. 20. Repreſents a View of the anterior Part of the Point of the Hook ſeparate.

Fig. 21. Exhibits a double pronged Hook for the ſame purpoſe.

CHAP.

CHAP. CLVI.

The Method of discharging Molæ, *or false Conceptions.*

A Mola described.

I. A *Mola* is a fleshy Excrescence, or Mass, without a regular Form produced in the Uterus, either from a Concretion of the menstruous Blood, a Retention of some Part of the Secundines, or from an Ovum not properly fecundated. This Disorder seldom happens to Virgins or Widows, but frequently to married Women, as we are assured by Experience, though they are sometimes observed in the two first, and I myself once saw one of them in a chast Widow[a]. If we regard the Size and Figure of this Substance, we shall find therein a surprizing Difference. Some of them are found not at all adhering to the Uterus, others are attached to it by one or two Blood-vessels, or fleshy Fibres, and others again are very strongly and intimately conjoined[b]. They are generally found alone in the Uterus, but sometimes they are excluded together with the Fœtus. If they are excluded without the Fœtus, it is usually about the End of the second or third Month, the same Pains generally preceding which attend a real Delivery, though the Pains are sometimes more violent, and the other Symptoms more severe, the Hæmorrhage is also frequently so large, as to put the Life of the Mother in the utmost Danger. Sometimes a Mola is retained for many Months in the Uterus, and acquires a Bulk sufficient to distend the Abdomen like a mature Infant.

Signs of a Mola.

II. It is, for the first four Months, a difficult Matter to distinguish, whether the Womb is impregnated with this false or a true Conception, since both of them are generally attended with the same Symptoms in that Time, but afterwards they afford Signs different enough to distinguish the one from the other. For, 1. when there is a Mola, the Mother does not perceive those Commotions in the Uterus, as she constantly does from the Infant about the fourth or fifth Month after Conception: 2. A Mola distends the Abdomen equally on all Sides; whereas an Infant makes it most prominent towards the Navel, or one Side. 3 A Mola, slips from one Part to another, when the Mother puts herself into different Postures, which is a Circumstance not to be observed, when there is a real and living Fœtus. 4. The Breasts of those who have a Mola, are generally but little or nothing distended with Milk; whereas they are gradually and considerably distended therewith, when there is a real Infant. 5. Lastly, the Mother is afflicted with more grievous Symptoms during her Pregnancy with a Mola, than with a Fœtus; her Face is of a livid Hue, her whole Habit and Appetite are greatly vitiated and impaired, and she is frequently molested with excruciating Pains about the Region of her Loins and *Pubis*; from all which one may conjecture, that there is not a Fœtus, but a Mola in her Uterus. But

[a] The like has been also observed by MAURICEAU towards the latter End of his Book, *Obs.* 33. and by KERKRINGIUS *in Spicileg. Anatom.* Obs. 81. which are discharged with violent Pains.

[b] Instances of this Disorder may be seen described by HILDANUS, *Cent.* II. *Obs.* 52. GUILLEMEAU *Lib. de Gravidit.* Cap. IV. SIGISMUNDA *apud* CONNOR *in Diss. Med. Physic. de humani Uteri Sarcomata*, pag. 57. SAVIARD *Obs.* 36.

it

it is to be obſerved, that ſometimes a Dropſy in theſe Parts may occaſion all the preceding Symptoms of a Mola.

III. When you are convinced, that there is not an Infant, but a Mola, in the Womb, the next Buſineſs is then to attempt its Expulſion by proper Medicines, and if they miſcarry, an expert Midwife or Surgeon ſhould endeavour to deliver this foreign Body from the Uterus by a judicious Application of the Hand. If the Mouth of the Uterus ſhould be too ſtrongly contracted to admit the Hand of the Operator for this purpoſe, it will then be neceſſary to excite the Mother's Throws by the Adminiſtration of briſk Cathartics and ſtrong Clyſters, while the *Os Uteri*, and Parts adjacent, are in the mean time gradually relaxed and opened by the Application of emollient Fomentations, *&c*, which done, one or two of the Fingers are to be firſt gently inſinuated, and then the whole Hand by degrees, in order to extract the Mola, as we have before directed for the Fœtus, *Chap.* CLIV. If the Mola adheres firmly to the Uterus, which it frequently does, it is then to be gently ſeparated by the Fingers before its Extraction, as we are told by HILDANUS[a], who performed this Operation. But if the Fingers are not able to make this Separation, it will then be neceſſary to apply a Pair of long and obtuſe-pointed Cutting-forceps, like that which we have repreſented in *Tab.* XXXIV. *Fig.* 1. and which, we are told, were ſucceſsfully uſed by SIGISMUNDA, a Midwife of *Brandenburg*, in the like Caſe. Laſtly, if the *Mola* is too large to be in this manner extirpated entire, it may be carefully ſeparated and extracted in pieces, either with the Fingers, a falciform Knife, or Hook, repreſented in *Tab.* XXXIII. *Fig.* 11, 12. Thoſe who are deſirous of more upon this Head, particularly with regard to the Nature and Extraction of *Molæ*, may conſult the Obſervations of HILDANUS, ROONHUSE & MAURICEAU. To conclude, when a Mola does not occaſion any bad Symptoms or Uneaſineſs in the Mother, and its Extraction appears difficult, in that Caſe no Violence ought to be uſed, ſince we have many Inſtances of their being retained without any great Detriment to the Patient as long as they live; as we read in HILDANUS, *Epiſt.* XXXVIII. XXXIX.

Method of diſcharging a Mola.

CHAP. CLVII.

Of a Prolapſus Uteri, *or bearing down of the Womb.*

I. AN entire falling down, or *Prolapſus* of the Womb, is, by many Phyſicians[b], eſteemed and aſſerted to be a thing impoſſible in Nature, whereas it is apparent, from the Obſervations of many eminent Phyſicians, both ancient and modern, that the Uterus does ſometimes fall down, and hang[c] out of

Kinds and Degrees of this Diſorder.

[a] *Cent.* II. *Obſ.* 52. and *Epiſt.* 38, & 39.

[b] Of this Opinion are MEEKREN, *Obſ.* Cap. 54. ROONHUYSE *Obſ.* Lib. II. Cap. *de Vagina Prolapſ.* VAN HORN *Microtechn.* Sect. II. Part. 1. §. 28. BARBET. *in Chirurg.* VANDER BEEKE Lib. *de Procidentia Uteri.* KERKRINGIUS *in Spicileg. Anat.* Obſ. 20. VERDUC *in Pathol. Chirurg.* and the many Authors cited by theſe.

[c] As ÆTIUS AEGINETA, ROSSET, AQUAPENDENS, CARPUS, PLATERUS, PAREY, PLEMPIUS, LANGIUS, FERNELIUS, HILDANUS, MARCHETTI, VESLINGIUS, BARTHOLIN, VANDER WIEL, PECHLIN, SOLINGEN, MAURICEAU, &c.

the Vagina; among which we may reckon thoſe as the chief, which are inſerted in the chirurgical Obſervations of the celebrated RUYSCH, *Obſ.* 1, 7, 9, & 10. which are illuſtrated with elegant Figures, from whence we have taken the two repreſented, *Tab.* XXXIV, *Fig.* 2 & 3. After RUYSCH we may reckon the celebrated Surgeon of *Paris*, SAVIARD, who gives us about ten Inſtances of this Accident[a] coming under his own Obſervation; to him we may add HOFFMAN, SHACHERUS, SLEVOGTIUS and VATERUS, who have each of them deſcribed, and been Eye-witneſſes of the *Prolapſus Uteri*; and laſtly, the Phyſician BURGRAVIUS[b] of *Frankfort*, with ſeveral others, have lately obſerved the ſame Diſorder; to which I may add, that I myſelf have ſeveral Times ſeen a true Prolapſion of the Uterus. When the Uterus only deſcends into the Vagina, it is then termed a Deſcent, or bearing down of the Womb; but when it proceeds further, and appears out of the Vagina, it is then properly denominated a *Prolapſus Uteri*; which may be of two kinds; either without Inverſion, when the *Os Tincæ* only appears externally, *Tab.* XXXIV. *lit.* C. *Fig.* 2. or, with Inverſion, when the Fundus preſents itſelf to View without the *Os Uteri internum*; ſee *Fig.* 3. both which Caſes have been obſerved by the forementioned Authors[c].

Diagnoſis. II. The *Prolapſus Uteri* without Inverſion is generally diſtinguiſhed from that with, by its *Os internum*, which does not appear in the laſt, as it does in the firſt, as we have repreſented in *Tab.* XXXIV. *Fig.* 2. *lit.* C, whereby it may be alſo diſtinguiſhed from a Prolapſus of the Vagina, or an Excreſcence of that Part. It may be worth our Obſervation, in this Place, to take notice of a particular Caſe, elegantly deſcribed and repreſented by DE WIDMANNUS, preſent Director of the *Academia Curioſ. Germ.* in which the whole internal wrinkled Coat of the Vagina was prolapſed in ſuch a manner, that every Body imagined it a *Procidentia Uteri*, before they were convinced of the contrary by opening the Body, by which they found the Uterus itſelf in the natural Site, the Figure of which Caſe we have repreſented in *Tab.* XXXIV. *Fig.* 4. that our Reader might the better diſtinguiſh a Prolapſus of the Vagina from that of the Uterus; ſo that the Appearance of an *Os Uteri* at *lit.* F. is not an infallible Sign of a Prolapſus thereof, as it hath been generally taught; but the prolapſed Parts ought to be more carefully examined, in order to diſcover whether it be a Deſcent of the Vagina, or *Os Uteri*. The forementioned Author does not indeed give us any diſtinguiſhing Mark, whereby to know ſuch a Prolapſion of the Vagina from that of the Uterus; though he obſerves, that his Probe paſſed further through this apparent *Os* of the Vagina *Lit. F.* than the Cavity of the Womb would admit of, *viz.* near ſix Inches; but whether this Sign always preſents itſelf, can be only confirmed or diſproved by more Obſervations of the like kind.

[a] In *Obſ.* 10, 11, 12, 13, 15.

[b] In Ephem. Nat. Cur. Cent. IV. pag. 261.

[c] See Commerc. Litterar. *Norimb. An.* 1733. pag. 362. —— WESSENFIELD de Inverſione Uteri ſub præſidio BERGENII, *Franc. ofurt.* 1732. Nor ought we to omit the warm Diſputes between the two *Hamburg* Phyſicians, VANDER BEEK and GARMEER, the firſt denying, and the laſt aſſerting and defending the Reality of this Diſorder; but when the Opinion of our Univerſity at *Helmſtad* was demanded on the Subject; their Aſſent was given in Favour of GARMEER, who has alſo himſelf defended the Theſis with learned Arguments and ſolid Experience.

III. A Prolapſus of the Uterus and Vagina are not only difficult to diſcern, but alſo to diſtinguiſh from each other, as may appear from the groſs Miſtake made, not only by the Surgeons of *Thouloufe*, but alſo of *Paris*, who publickly declared a Maid of thirty Years old, to be an Hermaphrodite, and to have the male Sex moſt predominant, who had only a *Prolapſus Uteri* from her Youth; and therefore the Senate of *Thouloufe* commanded, at her Peril, that ſhe ſhould, for the future, wear Mens Cloaths inſtead of Womens; but, ſome Time afterward, this reputed Hermaphrodite, dreſſed like a Man, and armed with a Sword, being more accurately examined by SAVIARD at *Paris*, ſhe appeared to be really a Woman, into which he tranſmuted her by replacing the Uterus; whereupon ſhe was ordered by the King to reaſſume her female Dreſs. The Surgeons of *Thouloufe* ſeemed to have formed their Judgment with too much Precipitation and want of Attention, ſince in the whole diverting Hiſtory, related at large by SAVIARD in *Obſ.* 15. we do not meet with ſo much as the Appearance of either Penis or Teſticles; without which I can ſee no Reaſon why they ſhould pronounce any Perſon a Man, eſpecially as ſhe had very large Breaſts, and a Woman's Face without a Beard. A Prolapſus Uteri and Vaginæ difficult to diſtinguiſh.

IV. The apparent and moſt general Cauſe of a *Prolapſus Uteri*, is from a too great Relaxation and Weakneſs of its Ligaments, and of the Vagina, upon which Account this Diſorder is moſt frequently obſerved to follow a difficult Labour, or other violent Straining, though it may ſometimes happen even to Maids and young Girls [a]. Let us now conſider the other Species of this Diſorder, in which the prolapſed Uterus is inverted like a Bag; ſo that its internal Surface appears outermoſt, its internal Orifice lying at the ſame time concealed in the Vagina, as in *Fig.* 3. B. of which, among others, we have a remarkable Inſtance deſcribed and cured by GENSELIUS [b]. As the Uterus prolapſed in this manner, reſembles a Mola, or fleſhy Excreſcence, we find it has occaſioned ſome imprudent Surgeons and Midwives to miſtake the Caſe, and, by an improper Treatment with violent Pulling, *&c.* to endanger the Life of the Patient [c]. Nor is this Diſorder hardly ever obſerved, but when the Uterus is forced down together with the Secundines, or after very difficult Labour, whereby the *Os Uteri internum* is ſo much dilated, as eaſily to tranſmit the Body of the Womb through itſelf [d], eſpecially when the Throws continue violent ſome Time after the Birth, ſo that by ſtraining, this Part is forced through the Vagina and *Labia pudendi*. But whatever be the Cauſe of the Diſorder, if the Uterus is not ſpeedily reduced to its natural Situation, the Caſe ſoon becomes paſt Cure, and kills the Patient, as is juſtly obſerved by the forementioned Authors; and therefore no Time ſhould be loſt before the Patient is relieved. Cauſes.

V. In order to reduce the prolapſed Uterus to its natural Situation, after the Patient has diſcharged her Urine, the Surgeon or Midwife is to place her in a Treatment.

[a] Inſtances of which we have in DE GRAAF *de Org. Mulier.* MAURICEAU *Obſ.* 96. SAVIARD *Obſ.* 13, 15. Miſ. Nat. Cur. Dec. I. An. 6. *Obſ.* 73.

[b] In Ephem. Nat. Cur. Cent. II. *Obſ.* 193. with other Writers there cited.

[c] See HILDANUS, BARTHOLIN, Cent. 2. Hiſt. 91. VANDER WIEL Cent. 1. *Obſ.* 67. MARCHETTI *Obſ.* 61. MURALTUS Miſc. N. C. Dec. 2. An. 1. *Obſ.* 112. SAVIARD *Obſ.* 15. Commerc. Litter. Norimb. Ann. 1733. pag. 302.

[d] See RUYSCH in *Obſ.* Citat. & in Adverſ. Anat. *Dec.* II. *Obſ.* 10. MAURICEAU Lib. III. Cap. 6. & in *Obſervat.* 355, 685. STALPART, VANDER WIEL Obſ. Rar. Cent 1. Obſ. 67.

proper Poſture, lying on her Back upon a Bed with her Hips elevated, and, after a careful Separation of the Placenta, if that adheres to the Uterus, the latter is to be prudently and ſpeedily replaced with the Fingers, which may be moſt commodiouſly performed by returning the pendulous Part, *Fig.* 3. C, with the three middle Fingers, paſſing them firſt through the Vagina, and then with the whole Hand into the Cavity of the Abdomen, which may be done the more eaſily, as the Accident happens ſooner after the Delivery, while the *Os Uteri* and Vagina are relaxed and dilated. When the Parts have recovered their former Situation, the Patient ſhould be put to Bed, and ordered to lie ſtill on her Back, with her Thighs cloſe to each other, and the Reſt in this Poſture is very often of itſelf ſufficient; yet it may not be amiſs to ſecure the Womb from falling down again, either in coughing, ſneezing, or otherwiſe by retaining the Lips of the *Pudenda* together by a proper Bandage. If this Diſorder has continued any conſiderable Time, it will not be long before it proves fatal to the Mother, according to the Obſervation of HILDANUS, STALPART, RUYSCH, SAVIARD, and others; for the Stricture made upon the *Os Uteri*, by the Inverſion of its upper Part, becomes at length ſo much increaſed by the Inflammation, as to prevent its being replaced, and, turning to a Mortification, deſtroys the Patient. If the Surgeon is called in time to a Woman in this Diſorder, his firſt Buſineſs is to remove the Inflammation, and to endeavour to return the Uterus, before which ſhould be premiſed a Diſcharge of the Urine, and bleeding in proportion to the Circumſtances of the Caſe, ſo that by preventing any Reſiſtance to the Womb from the Bladder, and by relaxing the Parts with Fomentations of warm Milk and Water, with other emollient and lubricating Medicines, the Hand of the Operator may, by theſe means, replace the Parts without much Difficulty [a], without which it will be impoſſible for the Patient to ſurvive, even though the Uterus were to be ſecured with a Ligature, and extirpated; for RUYSCH gives us an Example of this Diſorder, in which the Surgeon attempted to relieve the Patient, by making a Ligature, and cutting off the prolapſed Body of the Womb; but his Deſign miſcarried, and the Patient died ſoon after.

Treatment of a ſlight Prolapſus without Inverſion.

VI. This Diſorder is not near ſo dangerous when the Womb appears externally from a Relaxation of its Ligaments, but without Inverſion, and not in the Time of Labour; to diſtinguiſh which, we have given Directions before, N° II. for, in this Caſe, the Cauſe being from Relaxation, not Violence, it is not ſo likely to be attended with Inflammation, or Mortification. It is to be obſerved, that this Diſorder frequently happens, not only to Women in hard Labour, but alſo ſometimes to Maids, though ever ſo chaſt, as may be ſeen in the Obſervations of MAURICEAU, SAVIARD, and others. The Conſequences of this Diſorder, when neglected, are frequently very grievous, ſuch as violent Suppreſſion of the Urine, excruciating Pains in the Loins, with an Inflammation, Exulceration, Mortification, a Schirrus or Cancer, which become the more obſtinate and malignant as the Caſe is longer delayed. When this Diſorder proceeds from a Relaxation of the Parts in a weak Habit, and has been ſome time neglected, it is often impracticable to ſuſtain the Womb in its proper Situation,

[a] It has been a Matter of Conſideration with myſelf, whether Scarification of the tumified and inflamed Uterus might not be uſed to Advantage in many of theſe deſperate Caſes; at leaſt I think there is Reaſon enough to make a Trial.

but

but it will relapſe again either in walking, ſneezing, coughing, or moving the Body, eſpecially if it be not aſſiſted by a proper Bandage, and a retaining Inſtrument internally[a]; but if the prolapſed Uterus is once affected with a Cancer or incipient Mortification, the Reduction of it will then be to no purpoſe, as RUYSCH takes notice in *Obſ.* 9.

Method of Cure.

VII. If the Surgeon perceives, that the prolapſed Uterus is not yet infeſted either with Cancer or Mortification, his Intentions of Cure are chiefly two: 1. To reſtore the Parts to their natural Situation; and then, 2. to prevent a future Relapſe of them. With regard to the firſt, that may be generally performed without much Difficulty, either with the Fingers, as we before directed, N° V. or by a large Wax-candle; though many Women thus diſordered find no Difficulty in reducing their prolapſed Uterus themſelves without other Aſſiſtance; but, in difficult Caſes, it is often found neceſſary, not only to relax and lubricate the Parts, but alſo to empty the Bladder and Inteſtines, in order for a Reduction by the Hand, but to prevent a Relapſe is often difficult without the Aſſiſtance of Bandage, and a proper Machine. When the Parts therefore of the Uterus and Vagina appear to be greatly relaxed, and their Ligaments weakned, it may be proper, during the Time of the Patient's lying ſtill in Bed, to inject aromatic and reſtringent Fumes and Fomentations by the Inſtrument, *Tab.* XXXIV. *Fig.* 14. after which may be applied the T. Bandage, with a large Compreſs to the *Labia pudendi*. When the Uterus is ſwelled and inflamed, ſo as to prevent its Reduction, it ſhould be firſt treated with diſcutient Fomentations, and the Perſon diſpoſed to reſt for ſome Time in a warm Bed, before the Operation be attempted. When the Womb appears to be ulcerated, even that ſhould not delay its Reduction; for an Ulceration of this Part may be better cured in its natural Situation than in a prolapſed Poſture, as SAVIARD directs in his *Obſ.* That Surgeon alſo obſerved a Prolapſion of the Uterus in a Maid, who had alſo the Stone in her Bladder, and, after replacing the Uterus, he then extracted the Stone, and removed both Diſorders. See *Obſervation* 15.

Inſtruments to ſuſtain the Parts.

VIII. If the Diſorder is become inveterate, and the Parts will not of themſelves continue in their natural Poſition, it will then be neceſſary to paſs an Inſtrument or Peſſary up the Vagina for that purpoſe. The moſt convenient Peſſaries for this Uſe, are thoſe made of Box, hard Aſh, or Cork, perforated in the middle, and covered over with Wax, repreſented in *Tab.* XXXIV. *Fig.* 6, 7, 8, 9. though ſome may be made of Ivory, Silver, or Gold, for the more opulent. One of theſe Peſſaries of a proportionable Size is to be paſſed by the Fingers up the Vagina to the *Os Uteri*, to prevent its ſubſiding, and that the Inſtrument may be drawn out, and cleanſed occaſionally by the Patient, a String may be faſtened to it, as repreſented in *Tab.* XXXIV. *Fig.* 6, 10. The Peſſary may be deemed of a proper Size, when it is not too eaſily paſſed up the Vagina, but, fixing itſelf in the Vagina againſt the Uterus, ſuſtains the latter, and ought frequently to be twice the Diameter of the former. It is neceſſary that the Inſtrument be perforated in the middle, for the Extramiſſion of the Menſes, and other Sordes of the Part; and therefore thoſe Peſſaries, which are of a pyriform, or oval Figure, as in *Fig.* 10. are not ſo convenient and uſe-

[a] See the Obſervations of RUYSCH and SAVIARD on this Head.

ful

ful, though they are propoſed and deſcribed for this purpoſe of an enormous Size by PAREY, HILDANUS, SCULTETUS, ROONHUSE, and others[a]; to which we may add, that thoſe perforated Peſſaries will both admit ſtrengthning and aſtringent Fumigations and Injections to the affected Parts, and at the ſame time alſo allow a Paſſage to the Semen of the Huſband, which Advantages, the other Peſſaries that are not perforated, are deprived of. It is to be obſerved, that ſome Women are troubled with this Diſorder, when they are not with Child, and when they are, it diſappears; for the Dilatation of the Womb in Geſtation prevents its Deſcent, but this is not always the Caſe; for ſometimes the *Os Uteri* has appeared externally with the Head of the Fætus capable of being felt by the Finger.

Elaſtic Steel Peſſaries.

IX. SAVIARD, in ſeveral of his Obſervations[b], mentions an elaſtic Peſſary made of Steel, which ſurpaſſes all others in this Diſorder; but takes no notice either of its Size or Structure; however, GOELICHIUS of *Frankfort* formerly publiſhed a Diſſertation 1710, in which he deſcribes a new Method of curing the true *Prolapſus Uteri* by an elaſtic Peſſary made of Steel-wire, of which he gives us the Figure, but not in its proper Length or Thickneſs; which I have therefore taken care to amend in my Figure of it, *Tab.* XXXIV. *Fig.* 11. he orders its internal Surface to be covered with Linen, and its external with ſoft thin Leather, that it may not give any Pain or Uneaſineſs to the Patient, alſo to the Baſis of the Cone, he directs a String to be faſtened on each Side to extract it at pleaſure. The Inſtrument is to be a little compreſſed when it is introduced into the Part, after which it will expand itſelf by its Elaſticity, ſo as to remain fixed, and prevent a Deſcent of the ſuperincumbent Uterus. Its Author indeed confeſſes, that he has not yet made Trial thereof; but as it is furniſhed with all the requiſites of a good Peſſary for this purpoſe, he thinks it cannot fail of Succeſs. Laſtly, as this Inſtrument is very ſubject to be eat up with Ruſt, to which Iron or Steel-wire is ſo extremely liable, upon contact with any Humidity, it has been my general Practice to uſe only the wooden Peſſaries covered with Wax, as repreſented in *Fig.* 6, 7, 8; by which means I have generally obtained the Effect deſired.

CHAP. CLVIII.

Concerning the Prolapſus, *or bearing down of the Vagina.*

Nature and kinds of the Diſorder.

I. IT is not unfrequent for Surgeons and expert Phyſicians, as well as ignorant Midwives, to confound or miſtake a Prolapſus of the Vagina and Uterus with each other, and to call them by one Name, of which we have many Inſtances[c]; when at the ſame Time they are eaſily diſtinguiſhable to one, who, attending to the Symptoms of each Diſorder, is alſo acquainted with the anatomical Structure of the Parts. We take a Prolapſus of the Vagina to

[a] Confer MAURICEAU Obſ. 182. SAVIARD Obſ. 13. DEVENTER Cap. 29. &c.

[b] See his Obſervat. XIII, and XV.

[c] HILDANUS (Cent. IV. Obſ. 60, 61, & 62.) gives us three Hiſtories of this diſorder; but it does not appear from either of them, whether the Prolapſion was of the Uterus or Vagina.

be,

be, when that Body appears either wholly or in part without the *Labia pudendi*, whether it be from Relaxation, or any other Cauſe, in the manner repreſented at *Fig.* 4. *Tab.* XXXIV. A total Prolapſion of the Vagina ſhews itſelf without the relaxed *Labia* like a fleſhy Ring, red or bloody, and ſwelled more or leſs according to particular Circumſtances. If the prolapſed Part ſhould be violently inflamed and ſwelled, proceeding from difficult Labour, there is then great Danger of an incipient Mortification [a] following, as I have frequently obſerved; but when there are none of thoſe Symptoms, the Caſe is without Danger, and may be ſuſtained without any great Uneaſineſs by the Patient. In a partial Prolapſus of the Vagina, when only a ſmall portion of it appears, it may be frequently miſtaken for an Excreſcence, Ficus, or Sarcoma, and conſequently the Surgeon may treat it, to the great Danger of the Patient, either by Ligatures, or the Knife, as we have obſerved in Chap. CL [b]. In order to diſtinguiſh a Prolapſus Uteri from that of the Vagina, and both from an Excreſcence; it is to be obſerved, that the firſt never happens with an Inverſion but immediately after Labour; whereas the Vagina may ſubſide and appear externally at any Time, either within or without the Time of Geſtation. But, as I have before obſerved, the Accident more frequently attends a difficult Labour, as it happened to a Patient of mine ſo ſuddenly, while the Fœtus was *in Utero*, that the prolapſed Vagina was, in the ſpace of twenty-four Hours, ſwelled to the ſize of one's two Fiſts, appearing without the *Labia*, and beginning to be mortified, of which the Woman died in eight Days time, notwithſtanding ſhe was delivered. From what has been ſaid I think it apparent, that thoſe Phyſicians ſpeak inconſiderately, who aſſert, that the prolapſed Uterus may be extirpated, not only without hazarding the Patient's Life [c], but alſo that they may conceive and bear Children, notwithſtanding they are deprived of this Organ. Indeed no body denies that a Woman may conceive and bear Children after a Removal of an Excreſcence from the Uterus, or a part of the Vagina hanging out, in Form of the Womb, as in *Tab.* XXXIV. *Fig.* 4, & 5. but, for the ſame thing to ſucceed when the Uterus itſelf has been extirpated, is altogether fabulous and impoſſible [d].

II. With regard to the Treatment of this Diſorder, when it is without Inflammation, the prolapſed Parts ſhould be returned without the leaſt Delay, to prevent an Inflammation, Schirrus, or Gangrene: If the Parts are therefore without Inflammation they may be fomented with ſome aſtringent and diſcutient Liquor before they are replaced, or they may be returned immediately without ſuch Treatment either by the Fingers or a large Wax Candle, after which the Patient ſhould keep her Bed for ſeveral Days, retaining her Thighs cloſe together without moving her Body. However, I muſt needs think it the beſt Method to foment the Parts before their Reduction with a Decoction of diſcutient aromatic and aſtringent Herbs in red Wine, or *in Aqu. Calc. cum Sp. V.* for the ſame purpoſe may be alſo uſed the Fumes of Maſtic, Frankincenſe, Myrrhe, Amber, *&c.* conveyed to the Parts by a Funnel; ſee *Tab.* XXXIV. *Fig.* 4.

Treatment when without Inflammation.

[a] As we have Inſtances in SOLINGEN *Obſ.* 26. & NOLET Obſ. Curieuſ. *Obſ.* 5.
[b] Inſtances of this Diſorder are given us by TULPIUS, *Lib.* III. *Cap.* 33, 34. ROONHUYSE *Obſ. Chirurg.* Part II. pag. 68. KERKRING. *Obſ.* 53. BONET *Med. Septent.* Vol. II. *Obſ.* 33.
[c] A Caſe of this Nature we have in CARPUS, and in *Lib.* XXIII. *Cap.* 41. of AMBR. PAREY.
[d] Notwithſtanding we have ſeveral Authorities collected by MEEKREN in *Obſ.* 54.

con-

concluding with the T Bandage; by which means the prolapſed Parts frequently recover their priſtine Strength and Tenſion. In ſome Caſes it will be very ſerviceable to treat the Patient with mineral Waters of the chalybeat kind, and Preparations of Steel; but if the Diſorder is ſo inveterate as not to yield to any of the means propoſed, the Surgeon is then to uſe his Endeavours for palliating the Diſorder, and mitigating its Symptoms, by ordering the Patient conſtantly to wear the T Bandage.

Treatment when joined with Inflammation orSphacelus.

III. If the prolapſed Parts are inflamed, they ſhould be not only treated with diſcutient Fomentations and Cataplaſms applied externally, but alſo Internals and Bleeding ſhouid not be neglected, that, after reducing the Inflammation, the prolapſed Parts may be returned, which they cannot with Safety before, without Danger of a Mortification following; but if the Inflammation is not conſiderable, the Parts may then be frequently returned without any Danger, though if any Sphacelus or Excreſcence appear, which may be known from its Blackneſs and fetid Smell, diſcutient Fomentations and Cataplaſms ſhould be then applied, and the Parts treated as we have before directed for a Sphacelus, Part I. Book III. Chap. 14

CHAP. CLIX.

Of an Incontinency of the Urine in Women.

Nature of theDiſorder.

I. AN Incontinecy of Urine in Women frequently proceeds from ſome Violence in difficult Labour, or from a too great Dilatation of the Sphincter and Neck of the Bladder, made by extracting a large Stone, but ſometimes it happens without any external Violence from a natural Weakneſs, or a Palſy of the Sphincter-muſcle, which is ſometimes obſerved in Males, as we have before taken notice in Chap. CXXXVI. But whatever be the Cauſe of the Diſorder, when it is of long ſtanding, or proceeds from a Palſy, it is too often found inflexible, both to all the internal Medicines and external Means that have been hitherto contrived.

Treatment thereof.

II. When this Diſorder follows from an Extraction of the Stone, the Patient being young, it frequently diſappears of itſelf, or at leaſt by uſing the external or internal Remedies mentioned in N°. II. of the preceding Chapter; but if the Diſorder be of long Standing, and does not yield to thoſe Means, it is by Phyſicians generally eſteemed incurable; however HILSCHERUS, in a Diſſertation upon the Subject, affirms, the moſt likely Method of curing this Diſorder to be with a Peſſary, or Ring of a proper Size, as for the *Prolapſus Uteri*, Tab. XXXIV. *Fig.* 6, 7, 8. for, by introducing a Peſſary, or Ring of this kind, into the Vagina under the Urethra, the latter is ſo firmly compreſſed thereby, as to render the Urine capable of being retained or diſcharged at Pleaſure; ſee Tab. XXIX. *Fig.* 2. B. C.

CHAP.

CHAP. CLX.

Of the Perinæum *lacerated in Women.*

EVERY one that knows any thing of Midwifery and Surgery cannot be ignorant, that the Perinæum, or that Part between the Vagina and Anus, is frequently lacerated in Women when they have a difficult Delivery, either from the Fœtus being very large, monſtrous, or extracted double with its Nates foremoſt. To prevent a Diſorder of this kind from incurring worſe Conſequences by Neglect, in the firſt Place, the Wound is to be waſhed and cleanſed with warm Wine or Brine, after which it may be dreſſed with ſome vulnerary Balſam, or rather ſprinkled with a Powder of Gum Maſtic and Sarcocol, and if the Wound be not large, its Lips may be conjoined with ſticking Plaſters; but, if it be large, it may be better to join them by the knotted Suture with a crooked Needle and Wax-thread, as in other deep Wounds; but particular Care ſhould be taken, that the Patient lie ſtill in Bed, with her Thighs cloſe to each other, and to cleanſe and dreſs the Wound twice or thrice a Day till it is healed, which is often impracticable when the Diſorder has been neglected at the Beginning, as SOLINGEN remarks, *Obſ.* 82.

CAHP. CLXI.

Of Diſorders and Operations proper to the Anus, *and of* Clyſters.

I. A Clyſter is a liquid Remedy, to be injected chiefly at the Anus into the large Inteſtine; s with whoſe Adminiſtration almoſt every Nurſe is acquainted; the Word is derived from the *Greek* κλύζω, *abluo*, and is ſynonymous with Ἔνημα, *Injectio*; theſe kinds of Remedies were, by the *Latins*, called *Lotiones*, as we read in CELSUS, from whence the *French* Term *Lavement*, ſeems to be derived. In *Germany*, *Holland*, and moſt other Parts, this Remedy is uſually adminiſtred by the Bladder of a Hog, Sheep, or Ox, perforated at each End, as in *Tab.* XXXIV. *Fig.* 12. AA. being large enough to hold about a Pint, one of the Apertures in the Bladder is to be faſtened with ſmall Packthread, tied round the End of a Pipe made of Ivory or Bone, marked B. B. and by the other Aperture the Clyſter is to be poured into the Bladder, after which this Aperture marked D, is tied with a Ligature, to prevent its Eſcape; which done, the Pipe lubricated with Oil or Butter is thruſt into the Patient's Anus, lying on either Side with their Hips elevated, then untying the Ligature near the Pipe C, the Bladder is preſſed by the Hands, and the Liquor by that means forced into the Inteſtines. The Operation being finiſhed, the Inſtrument is extracted, and the Patient ordered to lie ſtill in his Bed, till he has a ſtrong Motion to Stool; for, ſays *Celſus*, *Non primæ Cupiditati dejectionis æger protinus cedere debet; ſed ubi neceſſe eſt, tum demum deſidere.*

Injection by a Pipe and Bladder.

II. The *French*, and ſometimes the *Dutch*, uſe a Pewter Syringe inſtead of the preceding Apparatus, the Capacity of the Inſtrument being large enough to

Injection of them by a Syringe.

hold a Pint; the Pipe of the Syringe nearly reſembles the former; but the Liquor may be thereby not only drawn in with more Eaſe and Expedition, but alſo more forcibly expelled and drove further into the large Inteſtines, yet the preceding Apparatus is more concealable and portable, and alſo leſs uneaſy to Infants and Women with Child; but for over-modeſt or baſhful Patients, the *Pariſians* faſten a Leather-pipe of about half an Ell long to the Syringe, whereby the Patient can adminiſter the Clyſter to himſelf, or, after inſerting the Pipe into his own Anus, another Perſon may force the Liquor out of the Syringe through the Pipe which lies under the Bed-clothes. Upon this Head the Reader may conſult HILDANUS *Cent.* I. *Obſ.* 7, 8. BARTHOLIN. *Hiſt. Anat. bb. Cent.* 6. DE GRAAF, in a profeſſed Diſſertation upon the Subject, with JUNKENIUS in his Surgery, and VALENTINUS in his *Politica Exotica*, pag. 89. where the Machinery for this purpoſe, and the Method of uſing the ſame, is deſcribed at large. For the reſt, I ſhall only obſerve it as a neceſſary Caution, never to adminiſter this Remedy either too hot or cold [a], but tepid, for either of the former will be injurious to the Bowels.

Their Compoſition. III. The Ingredients for this form of Medicine, with their Proportions and Uſes, belong properly to the Phyſician; however the Surgeon may learn from CELSUS, that, in ſlight Caſes, ſimple Water may ſuffice, or elſe Mead, Ptiſan, or a Decoction of Fenugreck, Mallows, and other emollient Herbs, may be uſed: To conſtipate the Bowels a Decoction of Vervine [b], ſharp and gently ſtimulating Clyſters may be made of Sea or Salt-water, with the Addition of Oil, Nitre, or Honey. When the Clyſter is more acrimonious, it evacuates more; but is not ſo long retained by the Patient. An emollient Clyſter for a nephritical Caſe or a Dyſentery, may be made of warm Milk only, or a Decoction of Cammomile, Paul's Betony, Honey, and Theriaca, and ſometimes ſimple Oil, may be injected for a Clyſter, as GALEN did in a Cholic.

Their Uſes. IV. With regard to the Uſe of Clyſters; they may be applied to Advantage; 1. In Coſtiveneſs, to excite a Stool: 2. To mitigate Pain in Cholics, Dyſenteries, the blind Piles, Stone, or Gravel, *&c.* 3. To cauſe a Revulſion downward in lethargic Diſorders, Apoplexies, Frenzies, and other Diſorders of the Head: 4. To promote Labour, whether the Fœtus be dead or living; and, in order to expel the Secundines where they are preternaturally retained.

Nouriſhing Clyſters. V. Laſtly, Clyſters are ſometimes uſed to nouriſh or ſupport a Patient, who can ſwallow little or no Aliment, by reaſon of ſome Impediment in the Organs of Deglutition, for which purpoſe may be uſed Broth, Milk, Ale, and Decoctions of Barley or Oats with Wine. Clyſters were uſed for this purpoſe by the Ancients long before the Moderns, as appears from CELSUS, who recommends Ptiſan or Gruel, though there are many Phyſicians, who deny that they can be of any ſuch Uſe as to nouriſh the Patient, notwithſtanding which we have a remarkable Inſtance, among others, of a Woman, that could not ſwallow, for the ſpace of 14 Days, during which Time ſhe was ſupported by nouriſhing Clyſters, as we are told by GARENGEOT in his *Chirurgical Operations*; to which we

[a] BARTHOLIN (in Hiſt. Anat. *Cent.* I. *Obſ.* 76.) has remarked the Death of a Patient to follow from the Adminiſtration of a Clyſter cold.

[b] Though CELSUS often mentions *verbena*, I imagine he intends corroborating Plants in general thereby, rather than the common Vervine.

may

may add, that there really are lymphatic or lacteal Veſſels in the large Inteſtines, capable of abſorbing and conveying nutritious Juices to the Blood, as may appear, not only from Anatomy, but alſo from many Clyſters being totally retained without any Diſcharge of their liquid Parts, as I have ſometimes obſerved.

VI. The Moderns have a new kind of Clyſter, made of the Smoke of Tobacco, which appears to be of conſiderable Efficacy, and was introduced firſt by the *Engliſh*, after whom it has been uſed by ſeveral of the other *European* Nations. It is uſed chiefly when other Clyſters prove ineffectual, and particularly in the Iliac Paſſion, and in the *Hernia incarcerata*, though it may be uſed for other purpoſes, and is particularly ſerviceable in an obſtinate Conſtipation or Obſtruction of the Bowels. Various Inſtruments have been contrived and uſed for this purpoſe; the firſt of which I believe was that of BARTHOLIN [a], which is followed by another of STISSERUS [b], formerly Profeſſor at *Helmſtadt*, and others have been alſo deſcribed by DEKKERUS and VALENTINE; ſee *Tab.* XXXIV. *Fig.* 13. But though the Machinery of theſe Authors differ in ſome reſpects, yet they all agree in this, that they have an Iron or Braſs Capſula marked A, large enough to hold about half an Ounce of Tobacco, to which Capſula are faſtened two Pipes, one of them marked B, is made of Bone, to be inſerted into the Anus, and the oppoſite Pipe marked C, is made like that End of a Trumpet, which is applied to the Mouth, and, being made of Ivory, the Patient, or an Aſſiſtant, may blow through it, and force the Smoke of the burning Tobacco E in the Capſula A through the Pipe B into the Anus. In this manner the Smoke is to be blown up the Anus till the Patient receives Stimulus enough to excite him to Stool; and if one Pipeful of Tobacco does not produce the deſired Effect, the ſame may be repeated at Diſcretion; or, if the common Tobacco is too weak, Recourſe may be had to the ſtrongeſt kind, termed *Canaſter*; the Uſefulneſs of which kind of Tobacco has been experienced to good purpoſe by myſelf and others in obſtinate or incarcerated Ruptures, when the common Tobacco has proved ineffectual, and when at the ſame time the Patient's Caſe has been judged deſperate, it has ſucceeded ſo well that I have had no Occaſion to uſe the Knife. The Smoke of the Tobacco ſeems to produce this Effect, by ſtimulating the Inteſtine ſufficient to make it contract, and withdraw itſelf into the Abdomen. For more upon this Subject, the Reader may conſult GRAFFIUS and SANZONUS, in a profeſſed Diſſertation publiſhed upon the Subject at *Ferole*, *An.* 1691.

Smoky Clyſters.

CHAP. CLXII.

Of Suppoſitories.

A Suppoſitory is a kind of Cone made uſually of Soap, Sugar, Allom, or a Piece of Tallow-candle about the Length and Thickneſs of a Finger, more or leſs in proportion to the Size and Age of the Patient, into whoſe Anus it is to be introduced, in order to give a Stool. This Form of Medicine is

[a] In Hiſt. Anat. Cent. VI. Obſ. 66. [b] In Epiſt. de Machinis Fumiductoriis, *Hamb.* 1686. edita.

ſometimes compounded of Ingredients adapted to the Patient's particular Caſe, as of Honey, Salt, Aloes, Colocynth, *&c.* If one Suppoſitory is diſcharged without giving the Patient a Stool, it may be then proper to introduce a ſtronger, and after that a third or a fourth, till they produce the Effect required. They are by ſome lubricated with Oil or Butter, before they are introduced, that they may paſs up the more eaſily; and others uſe a Lozenge of Sugar, or a piece of Linen rolled up and dipt in Salt-butter, which, in ſome Caſes, will make the Patient lax enough. For Ulcers of the Rectum, the beſt Suppoſitories are made of *Mel. Roſar. cum pulv. Maſtic. Myrrh. vel Colophon.* whereas thoſe compounded with *Euphorbium*, *Aloes*, and Subſtances which give a ſtrong Stimulus, are advantageouſly uſed to promote a difficult Birth, or to expel the Secundines when they are preternaturally retained in the Uterus. For the Adminiſtration of this Remedy the Patient ſhould be diſpoſed in the ſame Poſture as in giving a Clyſter, as we directed in the preceding Chapter, after which the Suppoſitory is to be gently protruded up the Anus with the Finger.

CHAP. CLXIII.

The Method of opening an imperforated Anus.

Nature and kinds of the Diſorder.

I. WE frequently meet with new-born Infants having no Perforation in the Anus, which are by the Phyſicians termed *Atræti*, which Diſorder may be ſoon diſcovered by the Infant's diſcharging no Fæces for ſeveral Days after Birth, if it be not before obſerved by the Midwife in waſhing and cleanſing the Infant[a]. When the Caſe has been too long neglected, the Aſſiſtance of the Surgeon is frequently called in to no purpoſe, as ROONHUYS obſerves. The Diſorder itſelf varies according to the Number and Thickneſs of Integuments which cloſe up the Paſſage; but there generally remains ſome Mark or Sign, either of a Prominence or Cavity, which denotes the Part that ought naturally to be perforated, ſometimes a thin Membrane only obſtructs the Paſſage, while, at other Times, the Parts are cloſed up with thick Fleſh; both which are obſerved by SAVIARD, *Obſ.* 3. But whatever be the Circumſtances of the Diſorder, if a Paſſage be not ſpeedily made to diſcharge the Meconium, the Retention of that Excrement will excite Gripes, Vomiting, Jaundice, Convulſions, the Iliac Paſſion, and at length the Death of the Infant. When there is a Cicatrix, or ſome Mark indicating where the Perforation is to be made, the Operation is then not very difficult nor dangerous, eſpecially if the Membrane be thin, but when ſuch Marks are abſent, and the Parts are cloſed by a thick fleſhy Subſtance, the Operation is then in a great meaſure dangerous, eſpecially when the whole Rectum is in that manner cloſed, even to the upper Part of the *Os ſacrum*, as I have twice ſeen; for then the Operation is generally performed to no purpoſe. ROONHUYS (*Obſ.* 2. *Part.* 2.) gives an Inſtance of the *Inteſtinum rectum* terminating in the Bladder.

[a] Inſtances hereof may be ſeen in WIERUS, HILDANUS Cent. I. Obſ. 73. ROONHUYS Obſ. 5. Part. I. & II. circa finem Obſ. 1, 2, & 3. MAURICEAU in Obſ. & SAVIARD Obſ. 3. *&c.*

II. When

II. When the Caſe appears remediable, and the Surgeon is determined to perform the Operation, the Infant is to be firſt held in a convenient Poſture by an Aſſiſtant, after which the Membranes may be cautiouſly divided with an Abſceſs Lancet[a], by directing its Point into the Rectum, which may be known to have ſucceeded by the Efflux of the Meconium; this done, the Finger being dipped in Oil, is to be paſſed into the recent Aperture, in order to examine the State of the Parts, and Vicinity of the Rectum; that then the Wound may be ſufficiently enlarged either way, according to the Direction of the Inteſtine, after which the Operator ſhould deſiſt till the Infant has freed itſelf from the offending Excrement; and, laſtly, a large Tent, ſpread with ſome vulnerary Ointment or Balſam, is to be introduced into the Wound, with a Thread annexed to it, whereby it may be extracted if it ſhould ſlip into the Rectum. A new Tent ſhould be applied after every Stool, and, after a few Days Continuance, the Tent may be ſpread with ſome deſiccative, inſtead of a digeſtive Ointment, as that *de Ceruſſa*; by which means the part may be cicatrized and prevented from growing together for the future. HILDANUS[b] introduces a leaden Pipe ſpread with *Ung. de Ceruſſ.* inſtead of a Tent, towards the latter End of the Cure, but to prevent the Pipe, or even the Tent, from ſlipping out, it is neceſſary to apply a Compreſs with the T Bandage.

Apertion when the Fleſh or Membrane is thin.

III. In this Operation it will not be very neceſſary to make an Apparatus of Inſtruments, Bandage, and Dreſſing, becauſe in many Caſes not the leaſt Time ſhould be loſt, in order to preſerve the Life of the Infant, yet it may be convenient to provide a Receptacle for the Fæces, during the Diſcharge of which the Surgeon may prepare his Bandage and Dreſſing.

A previous Apparatus unneceſſary.

IV. When the Obſtruction is made by a thick fleſhy Subſtance, the Caſe is then more difficult and dangerous; however 'tis better to try to ſave the Infant by performing the Operation, though it ſhould prove ineffectual, than to let it periſh without Help: In this Caſe the Operator is firſt to ſearch with his Finger upon the Part to feel if he can diſcover the Paſſage to the Rectum, marking the Place with Ink, and making his Inciſion about half an Inch wide, and if the Fæces do not follow, the Paſſage to the Rectum ſhould be then ſearched for with the Finger, and the Wound enlarged accordingly; but with Diſcretion, taking care that the Edge of the Knife be directed towards the *Os ſacrum*, to avoid wounding the Bladder in Boys, and the Vagina in Girls, concluding the reſt of the Operation as before at N° II.

Diviſion of the thick Fleſh.

V. If the Surgeon can find no Appearance of the Rectum, it is then either abſent or grown together, ſo that the Cure is either impracticable, or at leaſt very uncertain, yet the Infant ought not to be neglected, and therefore a Perforation ſhould be made either with the Trocar, *Tab.* XXIV. *Fig.* 2. or with a narrow Scalpel, with which laſt the Opening ſhould be inlarged diſcretionally, till the Fæces meet with a Paſſage; but if the Hæmorrhage ſhould be very profuſe, a Tent may be introduced with ſome Styptick, and the Remainder of the Dreſſing managed as before.

When there is no Mark of the Inteſtine.

VI. ROONHUYS, in his *Appendix of Obſervations*, pag. 2. Obſ. 1. gives us an Inſtance of a Girl four Months old, who had indeed a Perforation in the Anus,

Some Obſervations.

[a] See SCULTETI *Armament. Chirurg.* Tab. 45. Fig. 8.
[b] In *Cent.* I. Obſ. 73.

but

but ſo ſmall, that her Mother was obliged always to preſs out the Fæces with her Hands, but at length the Parts were ſo cloſed by the repeated Preſſure as to admit no Diſcharge at all; upon which followed a Tumour of the Abdomen, with violent Pains, and a Fever, which threatned the Life of the Infant; he therefore firſt made an Opening with an Abſceſs Lancet, and then enlarged it with Sciſſars; by which means a large Quantity of Fæces were diſcharged, the Tumour of the Abdomen ſubſided, the other Symptoms diſappeared, and the Wound was healed, as we directēd at N° II. SCULTETUS alſo gives us a Caſe of the ſame Nature in *Armament. Chirurg.* Obſ. 71. In ſome Girls who have their Anus imperforated, the Fæces have a Paſſage through the Vagina; in which Caſe the Parents would rather let the Patient be thus miſerably afflicted all her Life, than let the Surgeon perform his Operation.

CHAP. CLXIV.

Of a Prolapſus Ani.

Nature of the Diſorder.

I. THE *Inteſtinum rectum* is frequently inverted or prolapſed to ſuch a degree, both in Adults, as well as Infants, that it appears near a Hand's-breadth hanging out of its natural Situation. We have a remarkable Inſtance of this Diſorder given us by MURALTUS, in a Woman whoſe *Rectum* was prolapſed in a difficult Labour near the Length of one's Arm; and SAVIARD mentions a Prolapſus of this Part in an Infant to the Length of a Foot. The Diſorder is not only troubleſome, but alſo extremely painful and uneaſy, to ſuch as lead a laborious or itinerant Life; and ſometimes an Inflammation, Tumour, Gangrene, or Cancer ſeizes the Part; an Inſtance of which we have at the latter End of MEEKREN's *Obſ. Chirurg.*

Cauſe and Prognoſis.

II. The Cauſe of this Diſorder may be great Weakneſs or Relaxation in the Rectum, which frequently happens to croſs and clamorous Children, or from a Teneſmus, violent Pains with the Piles, a Dyſentery, a Stone, or Ulcer in the Bladder, a difficult Expulſion of the Birth, or of the Fæces, *&c.* The Diſorder is not difficult to cure when recent, and when the Patient is not of a weak and ill Habit; but, in the contrary Circumſtances, to effect a perfect Cure is next to impoſſible. If a Gangrene or Cancer ſhould infeſt the Rectum, the ſame Treatment is to be uſed as propoſed for Tubercles and a Prolapuſs of the Vagina, *viz.* the Application of diſcutient and emollient Remedies, and, if they prove unſucceſsful, an Extirpation of the morbid Part.

Reduction.

III. When a Surgeon is called to a Patient in this Diſorder, his Buſineſs is firſt to reſtore the Part immediately to its natural Situation, before he enquires after its Cauſes, or prepares his Bandage and Dreſſing; for the longer the Inteſtine continues prolapſed, the Tumour & Inflammation is generally ſo much the more increaſed, and conſequently the Cure proportionably more difficult. In order to reduce the Inteſtine, the Patient is to be firſt advantageouſly diſpoſed in a prone Poſture on a Bed, and the Rectum being fomented with warm Wine, or its Spirit with Milk, or even warm Water applied with a Sponge or Linen Cloths, it is to be then returned into its natural Poſition, with the two Fore-fingers covered with fine Linen, in the ſame Manner as we have directed for

for returning the prolapſed Inteſtines in Wounds of the Abdomen. This Buſineſs may be generally performed without much Difficulty, when there is no concomitant Tumour or Inflammation; but if they are preſent, in order to remove them, the Patient ſhould be bled, and the Parts fomented till the Tumour ſubſides, and a Reduction may be performed, which is ſometimes no eaſy Matter, requiring the Aſſiſtance of more than one Surgeon, as SAVIARD takes notice in *Obſ.* 14. In ſome Patients who are of a weak Habit, and have had the Diſorder on them a conſiderable Time, the Rectum will ſubſide or prolapſe again after its Reduction whenever they go to Stool; but then it may be eaſily replaced again, either by themſelves, or the Aſſiſtance of a Surgeon, who ſhould endeavour to prevent a Relapſe of the Diſorder, by ſtrengthening the Parts with proper aromatic and aſtringent Applications.

IV. It is generally more difficult to prevent a Relapſe, than to replace the Rectum; but for the firſt, it is to be attempted by the Application of two thick Compreſſes; one oblong, applied betwixt the Thighs and Nates, the other ſquare, traverſing the former upon the Anus, both which are to be retained with the T Bandage. The Compreſſes ſhould be moiſtened in ſome proper Decoction, rather than applied dry, which Decoction may be made ex *Rad. Biſtortæ, Tormentillæ cort. granator. quercus gallis, foliis Quercus*, &c. prepared by boiling them in red Wine; the Uſe of which Decoction ſhould be alſo repeated, when the Diſorder returns upon the Patient's walking, ſtraining, or the like. When the Diſorder is ſtill more obſtinate, Relief may be ſometimes had from the Application of a ſtrengthening *Diapaſma ex Maſtic. Colophon. Terr. Japonic. Sang. Dracon.* &c. aſſiſted with Compreſs and Bandage. For the ſame purpoſe may be alſo uſed ſtrengthening Clyſters made of a Decoction of aromatic and aſtringent Herbs in red Wine, by the repeated Application of which the Diſorder may be generally cured. Retention.

V. If all the Means before mentioned prove inſufficient, a Suffitus may be uſed *è Maſtic. Thur. ſuccin. piper. nigro* &c. the Fumes being conducted thro' a Tunnel in the Bottom of a Chair, keeping the Patient to an aſtringent and drying Diet, directing him to avoid ſneezing, vomiting, and all violent Exerciſe, till the Cure is confirmed. DIONIS, and ſome others, think a Relapſe of the Diſorder may be prevented upon going to Stool, if the Patient eaſes himſelf upon a Seat, which has a Hole no bigger than two Finger's Breadth, or about the Size of a Crown piece. Some introduce a leaden Pipe into the Anus, to prevent its Relapſe; but after all, when the Diſorder has continued a long Time in a weak Habit, the Patient can frequently find no Benefit, but by a conſtant Retention with Compreſs and Bandage, which are to be conſtantly wore Treatment of difficult Caſes.

CHAP. CLXV.

Concerning Tumours of the Anus, *ſuch as the* Condyloma, Criſta, Ficus, *and* Fungus.

I. THE lower part of the Rectum is frequently infeſted with Tumours, as well in its external as internal Part, which, from their different Size and Figure, are diſtinguiſhed into *Condylomata, Criſtæ, Fici* and *Fungi*; but they generally Their Nature and Kinds.

nerally agree in this particular, that they proceed from a redundant and vitiated Blood, ſtagnating in the hæmorrhoidal Veſſels, and particularly in the Glands of this part, whereby they are produced much in the ſame manner as Polypus's in the Noſe; and therefore thoſe who are ſubject to the Piles, are more frequently troubled with them than others. Theſe Tumours are frequently not only troubleſome, but alſo very painful to the Patient, rendring him incapable of ſitting or walking. Thoſe Tumours of this kind are the moſt malignant, which, according to CELSUS (*Lib.* V. Cap. 28. N° 14.) are in *Locis obſcœnis*, as they frequently proceed from the venereal Diſeaſe; and therefore the Ancients, who were ignorant how to cure that Diſorder, denominated them to be of the worſt kind.

Treatment. II. The Cure of theſe Tumours may be proſecuted according to the Directions which we have before given for other Tumours and fleſhy Excreſcences. *Chap.* XXVII. and CL. The Root of the Tumour ought to be divided, if it be not over large, either by Ligature, the Sciſſars, or Knife; if the Root is too large to be conveniently ſeparated by Ligature, it may be performed either with the Sciſſars or Knife, holding the Tumour faſt with a Hook or Pliers. The Wound being permitted to bleed in proportion to the Strength of the Patient, in order to prevent a conſequent Inflammation, and, after ſtopping the Hæmorrhage with proper Styptics, the Wound may be dreſſed, at firſt with ſcraped Lint, Compreſs and Bandage; but afterwards it may be proper to apply ſome vulnerary Balſam, deſiccative Ointment, and, laſtly, dry Lint, in order to cicatrize and heal the part. But Care ſhould be taken, in the ſubſequent Dreſſings, to remove any ſmall Parts of the Tumour that may yet remain behind, either by cutting them off with Sciſſars, or corroding them with blue Stone, or *Lapis infernalis*. I have even ſometimes known a total Separation of the Tumour made by the Application of Cauſtics, and with good ſucceſs, if Care be taken to defend the Anus and its ſphincter from Injury. It was the Practice, or rather Advice of the Ancients, to reduce theſe Tumours by the actual Cautery, when they would not give way to the potential or Cauſtics; ſee CELSUS *Lib.* VI. Cap. 18. N° II.

CHAP. CLXVI.

The Method of treating the bleeding Piles.

I. IN ſome Men the Mouths of the hæmorrhoidal Veins in the Rectum diſcharge a Quantiy of Blood at the Anus, either at certain periodical or unſtated Times, being frequently attended with Pain and Tumour of the Parts. This Diſorder is by Phyſicians termed the *open Piles*, or hæmorrhoidal Flux; which, if moderate, is healthy, and ought not to be ſuppreſſed, ſince the redundant and noxious Parts of the Blood are hereby diſcharged from the Body, many of whoſe Diſorders, as the Hyp, Melancholy, Madneſs, Gout, Aſthma, *&c.* are hereby prevented or relieved, according to the Obſervation of HIPPOCRATES, *Sect.* 6. *Aph.* 9. & 22. CELSUS *Lib.* 6. *Cap.* 18, & 19. But when too much Blood is this way loſt, it weakens the Patient, and may by degrees bring on a Dropſy, Cachexy, and other chronical Diſorders, which may render it abſolutely

ſolutely neceſſary to reſtrain, or at leaſt moderate the Flux. When the Ancients found aſtringent Medicines inſufficient for their purpoſe, they cauterized the bleeding Veins with a hot Iron, in the manner deſcribed by SCULTETUS, and repreſented in *Tab.* XLIV. of his *Armament. Chirurg.* while others tie up the Mouths of the bleeding Veſſels, by paſſing round them a crooked Needle and Thread; but the Moderns, judging the Method of the Ancients too cruel or ſevere, and often pernicious, generally leave the Caſe to Nature, except when the Diſcharge is profuſe, and then they treat the Patient not with Aſtringents, but rather with balſamic and incraſſating Medicines internally, not neglecting the Lancet, when Bleeding is neceſſary.

Palliation.

II. Though there are many Patients deſirous of having this Flux not only moderated, but even ſtopt, the prudent Surgeon ought not to countenance their Requeſt; before he has warned them of the formentioned Diſorders, or even Death, which they may, by this means, incur; but if they perſiſt in their Reſolution, or if the Flux exceeds its due Bounds, it may be then convenient to ſtop up ſome of the Mouths of theſe bleeding Veins, leaving only a few of them open, as HIPPOCRATES directs in *Aphor* 22. Sect. 6. In this Caſe therefore the Treatment may be as follows: firſt, bleed plentifully by the Lancet, then give laxative or cooling Purges; and, laſtly, a Clyſter may be given five or ſix Hours before the Operation following.

Chirurgical treatment.

III. The Patient being properly diſpoſed upon a Bed, and his Legs held by two ſtrong Aſſiſtants, in ſuch manner that the Surgeon may have free Acceſs and Inſpection of the Parts; he is then to tie up the bleeding Tubercles with a Needle and Thread, cutting off thoſe Parts which are preternaturally diſtended beyond the Ligature, taking care at the ſame time to leave a few of the ſmalleſt Veins open, as we before obſerved. Laſtly, if the Blood does not ſtop of itſelf after the Veſſels have bled a ſhort time, Styptics may be then applied with ſcraped Lint, Compreſſes, and the T Bandage, and, in the ſubſequent Dreſſings, may be uſed cicatrizing and vulnerary Unguents or Balſams; and, if any thing be obſerved yet remaining, it may be removed either by the Sciſſars or Cauſtic. Sometimes theſe bleeding Tubercles are ſeated ſo high in the Rectum as to be inacceſſible; and then the Ancients recommend the paſſing up of an actual Cautery in a Canula to reſtrain the Flux; but as this is a Practice too ſevere and dangerous, it is, in my Opinion, better to uſe the *Speculum Ani*, *Tab.* XXXIV. *Fig.* 15. whereby the Parts may be dilated ſo as to tie up or intercept the Tubercles in a Loop or Knot; by which means, with the Application of proper Internals, a profuſe Hæmorrhage in this Part may be reſtrained, without having recourſe to that ſevere Practice of the Ancients.

CHAP. CLXVII.

The Method of treating the Blind Piles.

Nature of the diſorder.

I. IT is obſervable, that the Veins ſpent upon the Rectum and Anus are ſometimes ſo much diſtended with Blood, as to be very painful and reſemble Tubercles, either like Peas, Grapes, Wall-nuts, or Eggs, and ſometimes

they are extended longitudinally like Fingers, without diſcharging any Blood; and theſe are by Phyſicians termed *Hæmorrhoides cæcæ*, or the blind Piles, which they diſtinguiſh from other Tubercles of the Anus by their Colour and Reſiſtance to the Touch; for theſe, being diſtended with thick Blood, appear livid, and, being preſſed with the Finger, feel like little Bladders diſtended with ſome Liquor; which two Circumſtances are not obſerved in the other Tubercles of this Part, conſidered in *Chap.* CLXV. Sometimes theſe diſtended Veſſels are ſoft and flaccid, giving little or no Pain, others are tenſe, painful, and inflamed, tormenting the Patient often to ſuch a degree, that he can neither ſit, ſtand, nor walk, often fainting with the Extremity of Pain, and more afraid than in real Danger of Death.

Cauſes and Prognoſis. II. The blind Piles moſt frequently occur in thoſe Men who are coſtive, and of a ſanguine plethoric Habit; to which we may add in Women, an Obſtruction of the Veſſels from any Preſſure of the Infant in Geſtation, or Separation of the Menſes. Theſe diſtended Veins become at laſt ſo turgid, as to burſt, and diſcharge their Contents, and then they are no longer the *Hæmorrhoides cæcæ*, but *apertæ*, ſometimes bleeding to ſuch a Degree, as greatly to endanger the Patient's Health. In the blind Piles the Parts are ſometimes ſo much diſtended, and the Pain ſo intenſe, as to cauſe a Spaſm or Cramp of the Sphincter-muſcle, which is ſometimes ſo forcibly contracted with excruciating Pain, as not to admit even the Adminiſtration of a Clyſter. Sometimes theſe diſtended Veſſels, if their Contents are not diſperſed in four or five Days time, degenerate into troubleſome and itching Ulcuſcles, and not unfrequently do they give Birth to an Abſceſs, or a ſtubborn Fiſtula.

Treatment. III. When the blind Piles are ſmall, and not very troubleſome, they need not the Care of the Surgeon; but when they are numerous, or large, incompaſſing the Anus like Grapes, and, by their Pain, moleſting the Patient, ſo that he can neither ſit, ride, walk, or go to Stool, in that Caſe the moſt ſpeedy Remedy is to make a Ligature upon thoſe which are moſt painful and large, whereby they will in Time ſeparate; but if there is alſo a violent Inflammation, it will be firſt proper to bleed, and to uſe cooling and laxative Medicines internally, with a proper Diet, while externally may be applied diſcutient and emollient Fomentations and Cataplaſms. The Patient may be ſometimes eaſed by anointing them with *Ung. Nutrit.* freſh Butter, Oil of Almonds, *&c.* and frequently the Application of Linen Rags, dipped in warm Spirit of Wine, with emollient Clyſters, are highly ſerviceable; and, if they do not take effect, Leeches may be applied to the turgid Veins, in order to remove their Tenſion, and diſcharge their Contents, which may be alſo effected by Scarification with a Lancet, when the Parts are either inflamed, or Leeches are not at hand. Then, after letting them bleed in proportion to the Patient's Strength, the Dreſſings may be made with ſcraped Lint, Compreſſes, and the T Bandage, which are to be renewed every Day, as long as the Diſorder continues. What ſpeedy Relief may by this way be had, no one can imagine but thoſe who have experienced. Sometimes the Piles are ſeated ſo far within the Rectum, as to be inacceſſible without dilating the Sphincter by the *Speculum Ani*, Tab. XXXIV. *Fig.* 15. and, upon their appearing, by the Help of this Inſtrument, they may be either ſcarified with a Lancet, or divided with the Sciſſars, in order to diſcharge their thick Blood, which will abate the Inflammation, Tumour, and Pain.

Pain. Sometimes, by this Treatment, the blind will turn to the open, or bleeding Piles, attended with a conſiderable Flux, which, however, ought not to be ſuppreſſed when within the Bounds of Moderation, as it may conduce much to the Patient's Health, and the Prevention or Removal of many obſtinate Diſorders, ſuch as the Gout, Gravel, hypochondriacal Melancholy, *&c.* upon which Account many Phyſicians recommend and excite this Evacuation; but as it muſt be attended with many Inconveniencies, and often bad Conſequences, I ſhould rather approve of promoting the Cure of thoſe Diſeaſes by other Evacuations.

IV. In order to prevent or relieve the blind Piles, nothing is more conducive than a ſpare and temperate Diet, with Bleeding, Spring and Fall, and oftner if required. Internally may be taken a Powder or Decoction *ex Millefol.* drank like Tea, carefully avoiding every thing which heats the Blood, and conſtipates the Bowels; of which kind are Aloes, Myrrh, Saffron, *&c.* with Wine, Anger, violent Exerciſe, profuſe Venery, and Riding, *&c.* Upon the firſt Appearance of the Piles with any Uneaſineſs, cooling and diluting Medicines ſhould be immediately employed with Laxatives and proper Diet, while externally may be uſed Fomentations and Cataplaſms, and, in urgent Caſes with moſt acute Pains, Leeches, or Scarifications with the Lancet, as we before adviſed. Prevention.

An EXPLANATION *of the* THIRTY-FOURTH PLATE.

Fig. 1. Repreſents the *Uterus* with a *Mola* adhering thereto, as they were obſerved by SIGISMUNDA, in a Lady, from whom that expert Midwife extirpated the foreign Body with Succeſs by a pair of large and obtuſe-pointed Sciſſars; ſee her Treatiſe *de Arte obſtetricandi*, in Præf.

Fig. 2. Exhibits a *Prolapſus Uteri* without Inverſion: A A denote the Pudenda, B the Uterus appearing externally; C the internal Mouth of the Uterus, which here appears on the out-ſide the Pudenda.

Fig. 3. Shews a *Prolapſus Uteri* with an Inverſion thereof: A A the Pudenda, B the inverſed Uterus hanging down, without any Appearance of its internal Mouth ſhewn by C in the preceding Figure; which, together with this, are taken from RUYSCH; C here denotes the lower Part of the Uterus, or its Mouth ſhewn by the ſame Letter in the preceding Figure.

Fig. 4. Repreſents a particular kind of *Prolapſus Uteri*, as it was firſt denominated; though it was in reality no more than a Prolapſus of the *Vagina*, according to the Obſervation of WIDENMANNUS, *in Ephem. Nat. Curioſ.* Cent. VIII. Obſ. 98. where the Hiſtory of the Caſe is more largely delivered, and the Figure of the Parts as big as the Life. In our Figure A A denote the *Labia pudendi*, B B the Nymphæ, C the Clitoris lodged betwixt the two former, D D D the prolapſed Vagina, reſembling indeed the Uteterus, but in reality no more than a Tumour formed by the Relaxation and Subſidence of the interior Coat of the Vagina; G, H, the Uterus itſelf ſeated in the Pelvis. We take no notice here of the Ligaments, Fallopian Tubes, and *Ovaria*, being impertinent to our Deſign.

Fig. 5. Is taken from the Chirurgical Obſervations of MEEKREN, to ſhew a Prolapſus of the Vagina and Uterus together: A the Uterus, B its Neck, C its internal Mouth, D the Pudenda, E E the Vagina divided and laid open,

F the Root of the Tumor appearing without the Vagina like a *Prolapſus Uteri*, G the Ligature with which the Root of the Tumor was compreſſed during its Removal.

Fig. 7, 8, 9, and 10. Repreſent ſeveral ſorts of Peſſaries, the firſt of which is round like a Ring, to which are faſtened Strings for extracting it out of the Vagina. That at *Fig.* 7. is of an Elliptic or oval Figure, at *Fig.* 8. quadrangular, and at *Fig.* 9. triangular; each of them being perforated in the middle, and formed out of Cork or Wood waxed over, or elſe of Silver or Gold made hollow, for the more opulent. The laſt of them at *Fig.* 10. is ſolid like an Egg, but leſs convenient than the former.

Fig. 11. Is an elaſtic Peſſary of Steel-wire, turned into a conical Worm as deſcribed by GOELICKIUS: This has alſo a String faſtened to it; but if there was another fixed to the oppoſite Side, it might be drawn out ſo much the more eaſily.

Fig. 12. Repreſents the Machinery commonly uſed with the *German* and *Dutch* People for injecting Clyſters: A A the Bladder of Liquor, which is large enough to hold a Pint; B B the Pipe of Bone or Ivory to tranſmit the Liquor into the Inteſtines; C C the Ligature immediately above the Pipe, which is to be untied when the Pipe is in the Patient's Anus; D D the Ligature which ſecures the Orifice, whereby the Clyſter was poured into the Bladder.

Fig. 13. Exhibits the Machine for giving a *Clyſma fumoſum* of Tobacco: A the Braſs Bowl or Capſule in which the Tobacco is burnt, B the Ivory Pipe to be paſſed into the Anus, C the Pipe, which, being in a Perſon's Mouth when the Tobacco is on Fire, the Smoke E is thereby blown through the flexible leathern Pipe D D into the Patient's Bowels.

Fig. 14. Denotes a Braſs Pipe for conveying Fumes or Vapours into the Vagina and Uterus. A the upper Part, which is full of ſmall Holes, and to be inſerted into the Vagina. B the lower Part, open, for receiving the Pipe of the Funnel.

Fig. 15. Is a *Speculum Ani*, or Inſtrument to dilate and and inſpect the Anus and Vagina in Diſorders of thoſe Parts: It conſiſts of a hollow Cone or Beak, whoſe two Sides are marked A A and B B, which, being gently warmed and lubricated with Oil, are then paſſed into the Anus or Vagina; and, by preſſing together the two Handles C and D, the Sides of its Cone are thereby gradually ſeparated, and dilate the Parts for Inſpection, E the Hinge, in manner of GINGLYMUS.

CHAP. CLXVIII.

Of Fiſtulæ *in the* Anus.

Diagnoſis and kinds of Fiſtulæ.

I. THOSE Ulcers in or near the Anus and Rectum, which are recent, and afford a *pus laudabile*, or uniform Matter, are termed Abſceſſes; but thoſe which are more inveterate, callous, and afford a thin fœtid Matter, ſuch have been generally denominated Fiſtulæ by the Ancients, and are diſtinguiſh-

Fig. 1.

Fig. 2.

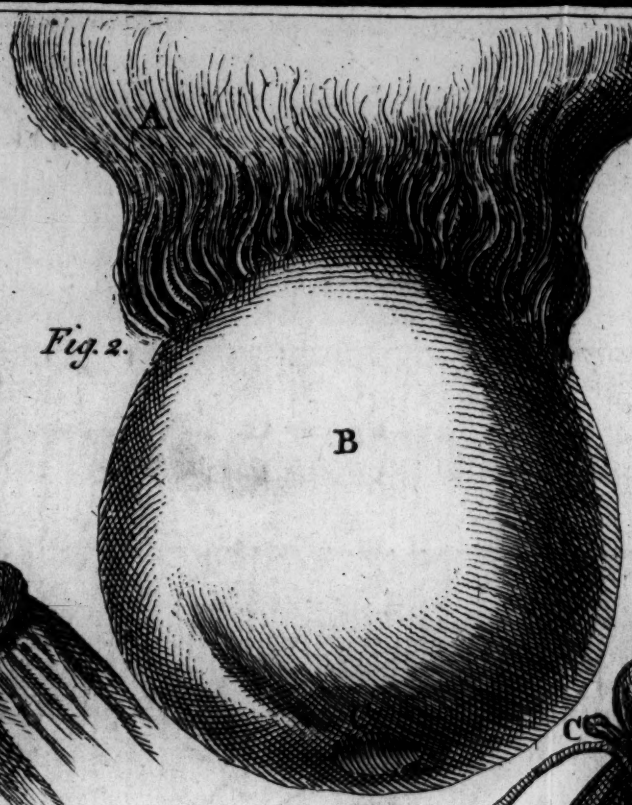


Fig. 12.

Fig. 5.

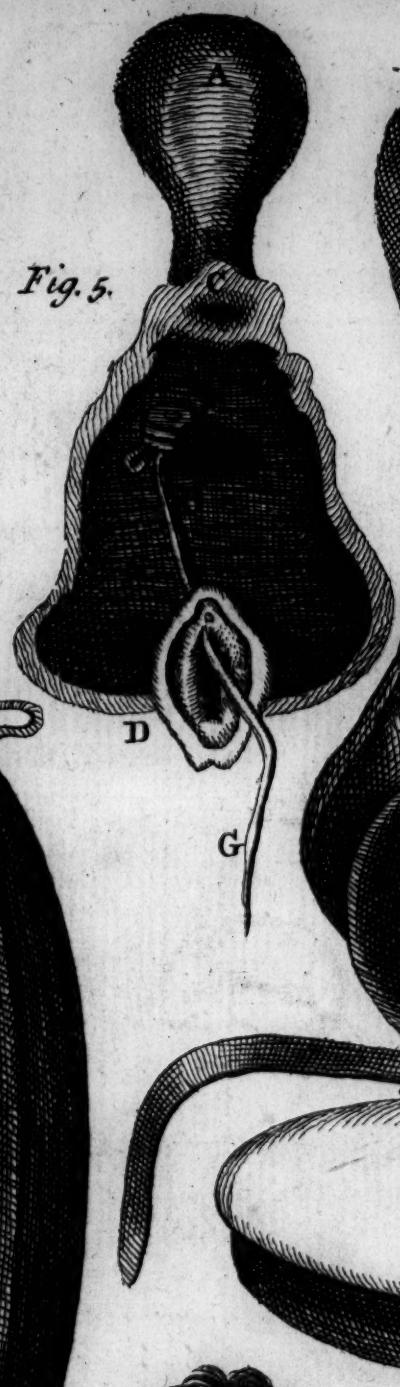
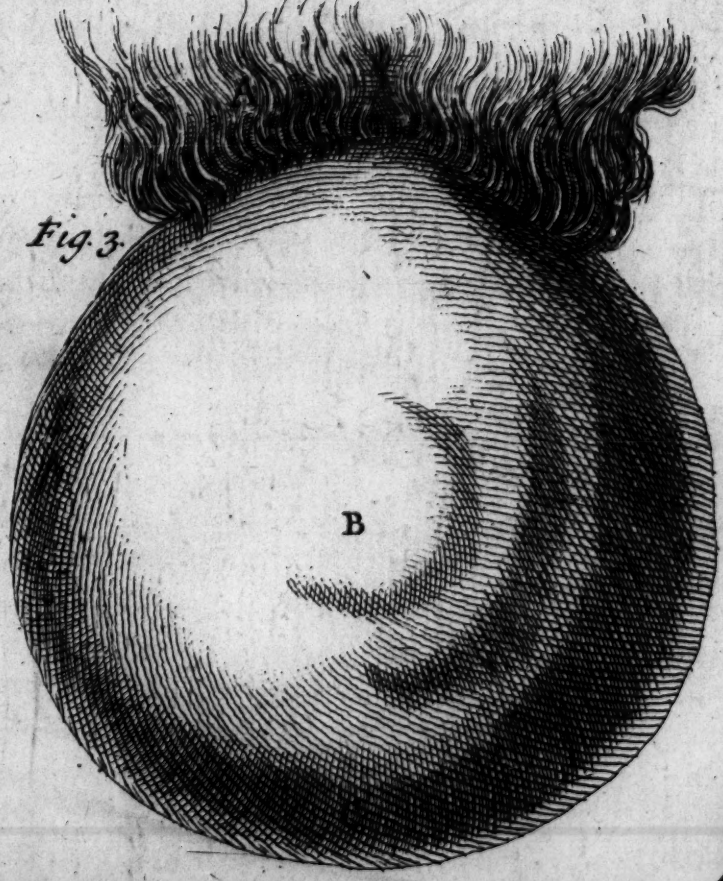


Fig. 3.



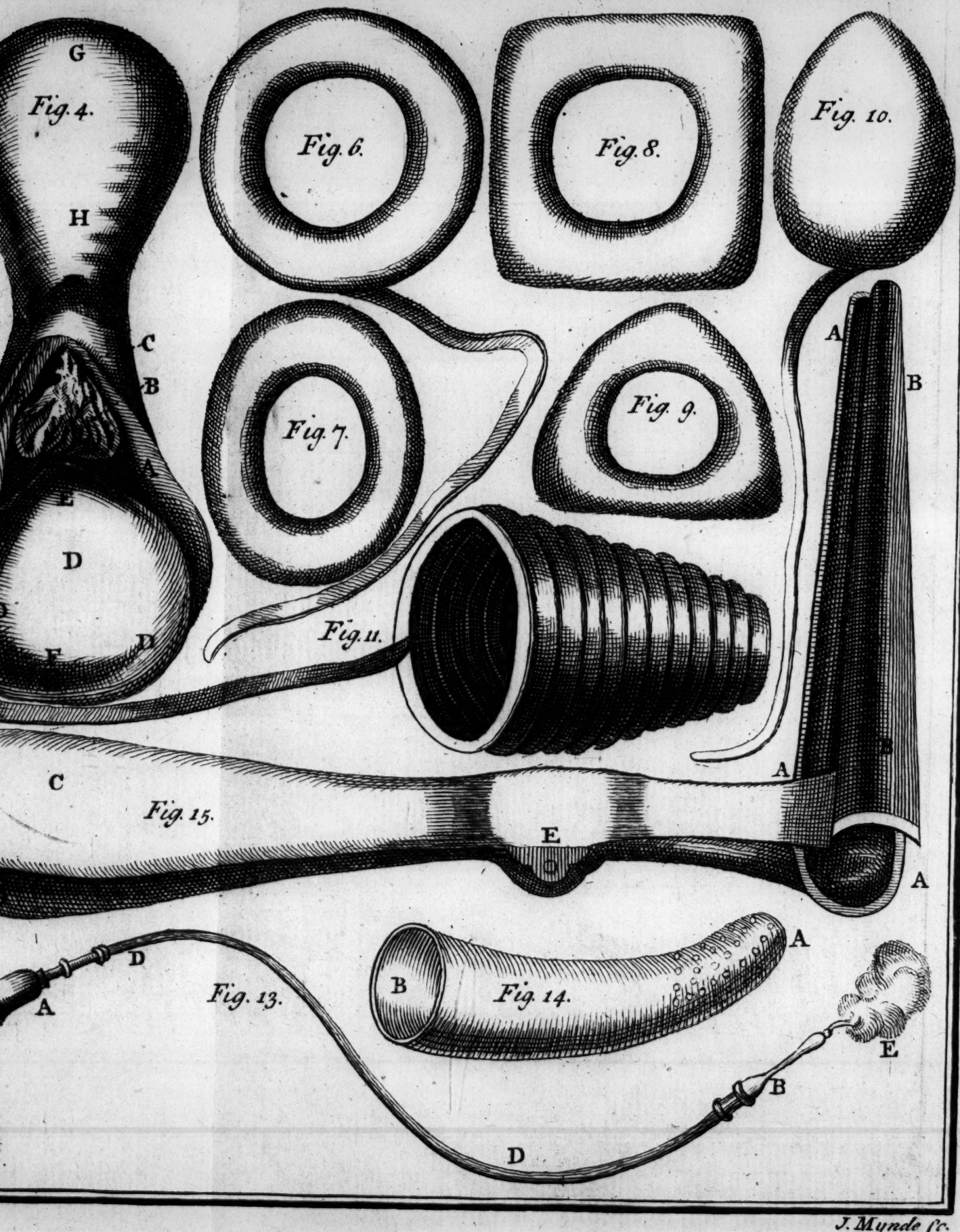

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Fig. 4.
Fig. 6.
Fig. 8.
Fig. 10.
Fig. 7.
Fig. 9.
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Fig. 11.
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Fig. 15.
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Fig. 13.
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Fig. 14.
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J. Mynde sc.

ed by them into various Species, according to their different Symptoms[a]. Some Fiſtulæ of the Anus are ſmall and recent, others are narrow, and penetrate deep; and others, again, are inveterate, and ſo large, that, having deſtroyed the Skin and Adeps, they expoſe the Rectum to View. Sometimes a recent Fiſtula has no great Calloſity, only the Margin of its Entrance is a little indurated. Sometimes the Fiſtula proceeds in a ſingle and ſtraight Courſe, and ſometimes, again, it is crooked, and, in a manner, divided into Branches. But before we proceed to a further Examination of this Diſorder in all its Species, we ſhall firſt diſtinguiſh three kinds of theſe Fiſtulæ remarked by the moſt expert Surgeons. Of the firſt kind are thoſe which do not perforate the Anus or Rectum, but have only a ſingle or double Opening externally near the Anus, by which they diſcharge a thin fœtid Matter, and are incompaſſed with callous Lips. To diſcover how deep, and what Parts the Sinus of the Fiſtula penetrates, a Search is to be made with the Probe, and one of the Forefingers, paſſing the firſt into the Sinus of the Fiſtula, and the other, lubricated with Oil, into the Anus; by which means the Probe, preſſing againſt the Finger, will diſcover whether there be any opening into the Inteſtine, or how thick the intermediate Partition remains[b]. Sometimes the Fiſtula is ſo crooked, that the Probe cannot follow it[c], and ſo we cannot be ſatisfied, whether the Sinus is deep or ramified; in this Caſe therefore it may be proper to inject the Fiſtula with warm Milk by a Syringe, obſerving how much it contains, and whether any of it eſcape into the Rectum, which will diſcover whether the latter be perforated or not. The ſecond kind of Fiſtulæ are thoſe which have ſeveral Openings, and at leaſt one of them perforating the Rectum, the reſt terminating outwardly near the Anus, as repreſented in *Tab.* XXXV. *Fig.* 1. C C; and that the Inteſtine is thus perforated, the Surgeon may be ſatisfied, if the Head of the Probe touch his Finger in the Patient's Anus, without any intervening Subſtance; or if, on the other Hand, a Clyſter or Milk being injected by the Anus, ſome part of it eſcapes through the external Orifice of the Fiſtula, through which the Fæces, Flatus, and Worms are alſo ſometimes diſcharged. The third and laſt kind of Fiſtulæ in the Anus, are thoſe which perforate the Rectum internally without any exteriour Opening, as is repreſented in the forecited Fig. F G; which laſt kind are denominated occult, blind, or imperfect Fiſtulæ; the two former kinds being tumid, manifeſt, or compleat. The occult Fiſtulæ are diſcovered by a Diſcharge of purulent, or corrupt Matter by the Anus, the Patient being ſenſible of a Hardneſs, Tumour, and Pain, without any external Opening near the Rectum. The internal Opening of the Fiſtula is generally near the Sphincter of the Anus, but ſometimes they open ſo high into the Rectum, as to be both inviſible and inacceſſible, both which may be ſeen in *Tab.* XXXV. *Fig.* 1. But whatever be the Condition of the Fiſtula, its opening ſhould be ſearched for with the Finger *in Ano*, lubricated with Oil or Butter, and, when that is inſufficient, may be uſed the *Speculum Ani*, or other convenient Inſtruments; but when the Sinus of the Fiſtula gives ſome external Mark, either by Tumour, Hardneſs, or the like, the Surgeon need not, in-

[a] See Hippocr. *Lib. de Fiſtulis*; and Celsus *Lib.* 7. Cap. 4. §. 4.
[b] Which has been obſerved by Ægineta, *Lib.* 6. Cap. 78.
[c] The Finger ſhould always be firſt paſſed into the Anus in probing a Fiſtula; r elſe you may be in danger of perforating the Rectum when there is no opening into it.

that

that Caſe, give himſelf much Trouble in ſearching for the internal Opening.

Other kinds of Fiſtulæ.

II. Thoſe Fiſtulæ which perforate the Inteſtine with one Aperture, and appear externally with another, are uſually termed perfect or compleat, while thoſe which have but one Opening are termed imperfect or incompleat. This laſt kind of Fiſtulæ are again diſtinguiſhed by the Difference of their Opening into external and internal. Fiſtulæ are again diſtinguiſhed into ſimple and compound; of the firſt kind are thoſe which perforate only the Integuments and Inteſtine; and the compound are thoſe which affect the *Os ſacrum*, or *coccygis*, Bladder [a], Urethra, Scrotum, and in Women the Vagina; by which means the Fæces of the Bladder and Inteſtines are frequently intermixed or confuſed, and ſometimes the Sinus of the Fiſtula penetrates into the Cavity of the Abdomen, which is of all the very worſt kind. Some Fiſtulæ are ſmall, and very tolerable, with little or no Uneaſineſs, while others are ſo extremely painful as to excite a Fever, or, by their too copious Diſcharge, extenuate and deſtroy the Patient: but when the Diſcharge is moderate, it may be ſometimes ſerviceable in preventing other Diſorders, as I remember lately in a Man, whoſe Fiſtula being cured, he fell ſick of the Gout, of which he was again freed upon its being opened. Some Fiſtulæ have their openings ſo very ſmall, as to be ſcarce diſcernible either with the Probe or otherwiſe; and ſome, again, have different Appearances, taking either an oblique Courſe, or paſſing in a ſtraight Direction, either ſingle or ramified, deep or ſuperficial, *&c.* ſo that it is frequently no leſs difficult to diſcover all the Circumſtances of this Diſorder, than to accompliſh its Cure.

Exploration of theſe Fiſtulæ.

III. In order to probe and examine a Fiſtula of the Anus, the Patient is to be firſt diſpoſed in a proper Poſture; and, after diſtracting and holding the Nates aſunder by an Aſſiſtant, the Surgeon then introduces his Fore-finger, lubricated with Oil or Butter, into the Patient's Anus; always obſerving this Caution, not to paſs his Probe far into the Fiſtula before he has thus introduced his Finger, otherwiſe he might be in Danger of making a Perforation into the Inteſtine, by preſſing too forcibly with his Probe upon a weak or extenuated Part.

Their Cauſes and Effects.

IV. The moſt general Cauſe of this Diſorder is uſually an Ulceration or Abſceſs, formed in the Piles in or near the Rectum, and eſpecially in the large Quantity of Fat, which inveſts that Inteſtine. But ſometimes the Cauſe of ſuch an Abſceſs may be a Contuſion or Wound from a Fall, or Blow, an Inflammation, Dyſentery [b], difficult Birth [c], immoderate Riding on Horſeback, the Venereal Diſeaſe, and many other of the like Cauſes. It has been an Obſervation made by many of the Camp-Surgeons and Phyſicians, that Troopers, or the riding Part of an Army, are very frequently troubled with this Diſorder, eſpecially after long Marches in hot Weather. An Abſceſs thus formed may degenerate into a Fiſtula, by the Neglect and Baſhfulneſs of the Patient, eſpecially if it be not timely opened and cleanſed from its foul Contents, by the Retention and Acrimony of which the adjacent Fat and Inteſtine are at length cor-

[a] *Fiſtulæ* penetrating into the Urethra and Bladder have been obſerved, long before myſelf, by Albucasis, Part. II. Chap. 80.

[b] As Marchetti has obſerved in *Lib. de Fiſt.*

[c] See Tulpius *Lib.* 4. Cap. 40.

roded

roded or ulcerated, and, in proceſs of Time, become callous, and indurated ſo as to be incurable by any Means without the Aſſiſtance of the Knife; a remarkable Inſtance of which we have in the *French* King *Lewis* XIV. who could not be cured by all the Skill and Endeavours of the moſt expert Surgeons and Phyſicians, till he was cut; and therefore the Knife ſhould be immediately applied to diſcharge the Contents of an Abſceſs in time, or even when there is Matter perceived in an Inflammation, either by feeling with the Finger internally, or by its pointing externally.

V. The Cure of this Diſorder is the more difficult, as the Fiſtula is larger, deeper, and has conſumed the Fat, with Part of the Rectum and its Sphincter-muſcle; and as its Sinus is more callous, and the Patient weak, or advanced in Years, which, when they all concur together, may render the Caſe deſperate and incurable. In particular, the Fiſtula is more dangerous as its internal Opening is ſeated higher up in the Rectum, where the Blood-veſſels are very large, ſo that the Operation of cutting may induce a fatal Hæmorrhage, as hath been ſometimes obſerved, it being hardly poſſible to tie up the Veſſels, or ſtop their Bleeding by the Preſſure or Reſiſtance of ſome hard Body, or by the Application of Styptics. And, to ſay the Truth, if the internal Orifice of the Fiſtula is not within Reach of the Finger, the Operation of cutting cannot well be performed without hazarding the Life of the Patient, and, without that Operation there are but little Hopes of obtaining a Cure; ſo that GARENGEOT judiciouſly adviſes the Surgeon in this Caſe, to refrain from the Knife, which might incur a fatal Hæmorrhage. And ſometimes, even when the Operation has been performed, we find ſo many and ſo deep Fiſtulæ, affecting either the adjacent Bone, Bladder, Urethra, or Vagina, in ſo deſperate a manner, as to render the Succeſs thereof very doubtful and precarious. Abſceſſes of the Anus, which frequently return again, are to be cured in the ſame manner with Fiſtulæ; that is, by dividing the Anus or Rectum with the Sphincter-muſcle. In a Woman with Child a Surgeon ought not to undertake the Cure of a Fiſtula *in Ano* till ſhe is firſt delivered, otherwiſe he may be the Occaſion of her Miſcarriage and Death, as MAURICEAU obſerves; and if the Fiſtula penetrates into the Bladder, Uterus, Urethra, or the adjacent Bones, the Diſorder hardly ever admits of a Cure. The blind or occult Fiſtulæ are alſo much harder to cure than the manifeſt or external and compleat; but, on the contrary, if the Fiſtula be recent and external only, or even compleat, as in *Tab.* XXXV. *Fig.* 1. CC. the Cure may probably ſucceed, provided there is but a ſmall Portion of the Fat, Rectum, or its Sphincter conſumed; the Sinus being ſimple, with little or no Calloſity, and affecting none of the conſiderable Parts beforementioned; and particularly, if at the ſame Time the Patient be young, and of a good Habit; but even then the Cure is to be expected more from the Knife, than the Application of Medicines. The ſame Judgment is to be alſo formed of the occult or internal Fiſtulæ, which open not far from the Sphincter-muſcle, as in *Fig.* 1. F G. Small Fiſtulæ, which open externally, may be continued to Ad- Prognoſis.

[a] SAVIARD gives us the Hiſtory of a weak Patient, who died the Day after the Operation, in his *Obſ.* 50.

See SAVIARD *Obſ.* 49. And PALFIN, (*Cap.* XX.) gives us an Inſtance, in which there was no Blood diſcharged from the Wound, but it all paſſed into the Patient's Inteſtine, ſo that he bled to death.

vantage,

vantage, and without much Trouble to the Patient, in ſuch Habits as have been long accuſtomed to a Diſcharge of pernicious Humours thereby, ſo that by keeping them open with a proper Regimen, the Patient ſometimes acquires a healthy old Age, as we have obſerved in treating of Ulcers. When an external Fiſtula or Abſceſs has ſo conſumed or extenuated the Inteſtine, as to leave but a very thin Partition between the Cavity of the Fiſtula and Inteſtine, the Diſorder is not then curable without dividing the Sphincter and Rectum, as we ſhall preſently direct, notwithſtanding the Inteſtine be imperforated by the Ulcer or Fiſtula[a]; but if the Partition or Sides of the Inteſtine appear thick and firm, a Cure may be then ſometimes obtained without the Operation of cutting; to which we may add, that Fiſtulæ, though recent, when they proceed from, or are accompanied with the venereal Diſeaſe, are hardly ever cured without cutting, and the Uſe of Mercury[b].

Preparation and Poſture of the Patient.

VI. Having deſcribed the Nature and kinds of Fiſtulæ in the Anus, we ſhall next proceed to deliver an account of the Preparation, or things previouſly neceſſary to their Treatment and Cure. We ſhall begin with the perfect or *compleat* Fiſtulæ, as they are introductory to the reſt. For the Cure of a compleat Fiſtula, indicated and encouraged both from its own Nature, and the Patient's Health and Habit of Body, *&c.* (as at Sect. V.) the firſt thing to be done here by the Phyſician or Surgeon, is to prepare the Patient to receive ſo great a Change, and particularly by Bleeding and Purging a few Days before the Operation; but, in weak Habits, they ought to be omitted, and the Patient rather ſupported with a ſtrengthening Diet, and Exhibition of Alteratives, to correct the State of his Juices according as they are indiſpoſed. A few Hours before the Time fixed for the Operation, a Clyſter ſhould be adminiſter'd to empty the Inteſtines, that their Contents may neither offend the Operator, nor the future Diſcharge of them make it neceſſary to take of all the Dreſſings before the due Time; and, in the next Place, the Patient ſhould make water a little before the Operator begins, that its Diſtention may not be any Impediment to the Work, nor render the Bladder itſelf liable to be injured. As for the Poſture of the Patient, it may nearly coincide with that for probing the Fiſtula at Sect. III. lying in a prone Poſture with his Thighs divaricated. Indeed the Ancients, and particularly ÆGINETA, recommend a ſupine Poſture; and the modern *French* Surgeons, according to the Account of GARENGEOT, prefer diſpoſing the Patient in the ſame manner as for a Clyſter, lying upon his Side near the Edge of the Bed, with his Thighs drawn up towards his Abdomen; but though this Poſition may be convenient enough, in many Caſes, for performing the Operation, yet I have ſeveral times found, that the particular Diſpoſition and Courſe of the Fiſtula rendered the firſt Poſture moſt convenient, both for examining and cutting the ſame.

The Operation for compleat Fiſtulæ.

VII. When the Patient is fixed in a convenient Poſture, the Surgeon's next Buſineſs is to chooſe a fit Inſtrument for performing his Operation; which, among the Ancients, was a peculiar ſort of Knife, in the form of a Sickle, denominated (from the Diſorder and its Office of cutting) by the *Greeks*, *Syringotomus*; the moſt uſual kinds of which Inſtrument are repreſented in *Tab.*

[a] As SAVIARD takes notice in *Obſ. Chirurg.* 49.
[b] See LE DRAN, *Obſ.* 85.

XXXV. *Fig.* 4, 5, 6, 7. where A B denote the ſharp Edge of the Inſtrument for cutting, B C the obtuſe or Probe End of the Inſtrument, which ought to be flexible, D D the obtuſe Back of the ſame Inſtrument, which is convex. Notwithſtanding theſe Inſtruments are rejected as uſeleſs by many of the Moderns, I am yet convinced by Experience, that they may be frequently uſed to Advantage for cutting thoſe Fiſtulæ, which do not run deep, or are only ſuperficial. When a *Syringotomus* has been choſe ſizeable to the Depth of the Fiſtula, in order to uſe it, the Fore-finger of either Hand is to be firſt lubricated with Oil, and paſſed into the Rectum, and then the Probe End of the Inſtrument, marked C, is thruſt in at the external Aperture of the Fiſtula, till it reaches the Finger *in Ano*, whereby it is to be alſo inflected, and brought out again at the Anus, after which, taking hold of each End of the Inſtrument, it is to be drawn forward, ſo as to divide the intercepted Parts of the Anus and Rectum; by which Means too the Sphincter-muſcle may be divided without Damage to the Patient; (ſee SCULTETI *Tab.* XLV.[a]) But as the ſuperior Aperture of the Fiſtula in the Rectum is generally callous, which Calloſity cannot be removed in this Method of cutting, and as without that there can be no Cure performed; it may be therefore proper, in ſuch a Caſe, to cut the Remainder, which is higher up in the Inteſtine, with a pair of Sciſſars.

More modern Inſtruments for cutting.

VIII. But ſome of the more modern Surgeons think, that the Falciform knife with an obtuſe Point (repreſented in *Tab.* V. *Fig.* 3.) may be more advantageouſly uſed for cutting Fiſtulæ in this Part: But I cannot be of their Opinion; for Experience aſſures us, that it can be only uſed with Succeſs in Fiſtulæ which are ſuperficial, and which do not run deep. In ſuch Fiſtulæ I have indeed happily uſed this ſort of Scalpel, and it was with one of the ſame kind, having a Button at the End, that the *French* King was happily cut, and cured; whence it has been denominated *Biſtouri Royal:* But, as I obſerved, neither this Scalpel of ours, nor that uſed upon the *French* King, can be advantageouſly uſed in deep Fiſtulæ. We are therefore obliged to the celebrated Surgeon M. BASSIUS of *Hall*, for the Publication of a new Scalpel for this purpoſe; (ſee *Tab.* XXXV. *Fig.* 8.) in a Treatiſe *de Ani Fiſtula*, *Halæ* An. 1718. which Scalpel he deſcribes to be armed with a long and flexible Point of Silver. The Beak of this Inſtrument, marked C, is to be paſſed into the Fiſtula, and brought out at the Anus, in the ſame manner as directed before in the preceding Section. For this Operation of cutting Fiſtulæ in the Anus, may be alſo commodiouſly uſed the *Syringotomus* in part deſcribed by GARENGEOT, and repreſented here in *Tab.* XXXV. *Fig.* 3. the Management of which is alſo like the preceding; but it may be better held and guided by the Handle E E; and, as the long Beak C D is incommodious, I have contrived another protracted only to F, which I find to perform its Office more conveniently.

Other Methods.

IX. There are ſome, who paſs a flexible Silver-wire through the external Aperture of the Fiſtula, inſtead of the Probe-End of the forementioned Inſtruments; which Wire they bend and draw through the Rectum and Anus, as in

[a] There are many, who imagine [after ALBUCASIS, Part. II. Cap. 80, and the Ancients] that a diviſion of the Sphincter-muſcle will be attended with an involuntary diſcharge of the Fæces; but repeated Experience aſſures us, that, on the contrary, the Muſcle may be ſafely inciſed, and healed, without being attended with any ſuch Conſequence.

Tab. XXXV. *Fig.* 1. DD, and then joining and drawing the two Ends of the Wire tight together, they divide the fleſhy Parts which it intercepts, marked CC, BE, with a falciform Inciſion-knife. This Method, which was formerly ſtarted by ÆGINETA, is ſo much in Favour with GARENGEOT, that he thinks it more likely than any of the reſt to prevent a Return of the Diſorder; but by what means it can make any ſuch Prevention, I am ignorant, notwithſtanding its Recommendation from Antiquity. Others, again, uſe a flexible and grooved Probe or Director, *Tab.* I. *lit.* M. or *Tab.* XXXV. *Fig.* 2. which being paſſed into the Fiſtula, and inflected ſo as to come out of the Anus, they then divide the intercepted Parts, by cutting into its Groove with a Scalpel or Sciſſars; which Method is cried up by the Moderns, as preferable to all others in deep Fiſtulæ; but in what it excels them, I know not. But in whatever Method the Patient is to be cut, the Surgeon ſhould do it with great Care and Circumſpection, to avoid wounding any of the larger Blood-veſſels in the Rectum, which, in deep Fiſtulæ, might occaſion a fatal Hæmorrhage [a]. After the Parts are inciſed, they ſhould be cleanſed from their Blood, and the State of the Wound examined, to obſerve if there are Sinuſes and callous, or corrupt Parts, which lie as yet concealed; that ſuch Parts may be afterwards laid open, and further inciſed by the Scalpel and Finger, or Probe and Sciſſars. But if the Weakneſs or Timorouſneſs of the Patient forbid the Surgeon to inciſe, and lay the whole open in this manner at the firſt cutting, as is frequently the Caſe, yet he ſhould not neglect to do it afterwards; taking care to cut off the moſt callous Parts, if poſſible, and to ſcarify the reſt, by cutting either with the Scalpel or Sciſſars, as may be moſt convenient. By this means a more ſpeedy and copious Suppuration will be induced, and the indurated, or corrupt Parts, will be the ſooner removed by eſcharotic and detergent Medicines. And, to ſpeak the Truth, the Mundification and Agglutination of the Wound can never more happily or ſpeedily ſucceed, than when all the callous and corrupt Parts have been exactly removed by the Knife or Sciſſars.

RUNGIUS's Method deſcribed.

X. I had another Method of performing this Operation with different Inſtruments communicated to me by RUNGIUS of *Bremen*, while I reſided there to attend ſome Patients for the Stone. He uſes three Inſtruments, which are no where elſe deſcribed; the firſt is a grooved Probe or Director made of Steel or Silver, a lateral View of which you have *Tab.* XXXV. *Fig.* 9. CD is the Handle, which is bent outward at E, ſo as to form an obtuſe Angle. The Groove of the ſame Inſtrument is repreſented directly to the Sight in *Fig.* 10. His ſecond Inſtrument is a Silver or Steel Canula, about the thickneſs of one's Finger, with a crooked Handle, as in the preceding, but in an oppoſite Direction, as repreſented in *Fig.* 11. AB. The Cavity of this is ſhewn more directly to the View in *Fig.* 12. His third and laſt Inſtrument, a Scalpel with a long and narrow Blade, *Fig.* 13. For the Uſe of theſe Inſtruments let us ſuppoſe a Fiſtula in the left Side of the Anus, as at *Fig.* 1. CC, the Canula (*Fig.* 11. AB.) being firſt dipped in warm Water, and then lubricated with Oil, is next paſſed into the Rectum, and its Handle D given to be held firm by a prudent Aſſiſtant. Then the Operator takes the grooved Probe (*Fig.* 9.) warmed and lubricated like the former, and paſſing through the external Aperture of

[a] As SAVIARD remarks in *Obſ.* 49. and PALFYN *Operat. Chirurg.* Cap. 20.

the

the Fiſtula, and obliquely through its interior Orifice into the Rectum, conducts its Point ſo as to enter the Canula, preſſing it hard againſt the ſame: That it has entered the Canula, he perceives partly by the Ear, and partly by feeling with the Finger *in Ano*. He then holds the Probe or Director in his left Hand, while, with his right, he takes the Scalpel, *Fig.* 13, and paſſes it along the Groove of the Director to the Canula; by which means he divides the Fiſtula in a Direction outward from the Inteſtine, conducting the remainder of the Treatment and Dreſſing, as before. This Method ſeems to be preferable to the reſt for deep Fiſtulæ, becauſe the End of a Syringotomus, or even of a Probe, cannot in ſuch be eaſily inflected, and brought out again through the Anus, without the Hazard of lacerating and injuring the Parts; but even this requires the utmoſt Precaution, to prevent the Knife from ſlipping beſide the Canula, ſo as to avoid wounding the Rectum, and adjacent Parts; for which Reaſon the Canula, *Fig.* 11. is made thus large. I am ſenſible that a Method was propoſed by Massier before Rungius, for cutting Fiſtulæ of this Part by paſſing a ſtraight Canula into the Anus, and cutting either with a direct or crooked Scalpel; which I alſo remember to be a Practice recommended by Raw in his *Chirurgical* Demonſtrations; but this Method of Rungius appears the moſt convenient, and the beſt adapted to avoid the Injuries which may attend the others.

Treatment of external and ſuperficial Fiſtulæ.

XI. If a Fiſtula or Abſceſs be recent and ſuperficial, terminating in the Skin and fat Membrane, without penetrating the Sphincter *Ani* or Rectum, it ſhould then be firſt enlarged or dilated, (if narrow, as is generally the Caſe) by inſerting Tents made of prepared Sponge, or of Gentian, and other Roots, which gradually ſwell, and extend the Parts by their imbibed Moiſture; after a ſufficient opening this way obtained, the Parts are to be firſt cleanſed with Eſcharotics and Detergents, and then conſolidated, or healed, according to the Directions which we have before given for Fiſtulæ in general (in Part I. Book V. Chap. *on Fiſtulous Ulcers.*) But, in many Caſes, it is moſt adviſeable to dilate immediately with the Knife or Sciſſars, dividing the incumbent Skin and Fat by a ſimple Inciſion; which muſt alſo be the Method when Tents do not prove ſufficient to make a patent opening, for the removal of what is become callous; and then, for the firſt Dreſſing, it may be ſufficient to dilate the Fiſtula with dry Lint; and, at every ſucceeding Dreſſing, if more Sinuſes appear, they muſt be laid open, and deterged, as before. The callous, indurated, and foul Parts may be gradually removed at every Dreſſing, partly by the Knife and Sciſſars, and partly by the Uſe of Eſcharotics, (particularly *Merc. præcip. rubr.*) applied where the firſt cannot conveniently reach. When the vitiated Parts are thus removed, you may dreſs with ſome digeſtive Ointment, as *Ung. Apoſtolor. cum ol. ovor.* and when the Sanies, or thin Ichor, diſcharged from the Fiſtula, changes its diſagreable Smell, Colour, and Conſiſtence, for that of a thick uniform Matter, its Cavity filling up with new and ſound Fleſh; there then remains nothing more to do than to heal and cicatrize with ſome vulnerary Balſam, and the daily Application of *Sp. Vini*, *Aqu. Calc.* and, at the End, of dry Lint only. Sometimes a ſmall Tubercle appears inſtead of an external Opening in theſe Fiſtulæ, and, upon a ſtrict Survey of the Tubercle, it appears perforated with a ſmall Pin-hole leading to the Sinus of the Fiſtula; and, in this Caſe

too, the ſmall Track is to be laid open, and followed to the Extremity, removing the Calloſity, deterging, and healing as before

Treatment of the deeper Fiſtulæ.

XII. But if the Fiſtula has ſo far penetrated as to enter the Rectum, Anus, or its Sphincter, or ſo as to make the Side of the Inteſtine very thin; the Caſe will then hardly ever admit of a Cure without the Operation of perforating and cutting the Inteſtine, together with the Sphincter, as we before obſerved. Therefore to cut a Patient for a Fiſtula of this Nature, the Surgeon, having fixed him in a proper Poſture, firſt introduces his Fore-finger into the Anus, and then paſſes a Probe, or the Probe-end of a Syringotomus, *Tab.* XXXV. *Fig.* 5.) down to the Bottom of the Fiſtula towards the Rectum, making a Perforation into it againſt the End of his Finger; but in ſuch a manner as to avoid injuring any other Part of the Rectum, Bladder, *&c.* he then inflects the End of the Inſtrument which perforated the Inteſtine, and brings it down through the Anus, thereby dividing the Parts, as we before directed at Sect. VII, VIII, and IX preceding. And thus an incompleat Fiſtula is converted into a perfect or compleat one. When a Fiſtula near the Anus tends towards either Side of the Perinæum, rather than to the Inteſtine itſelf, it is then adviſeable to lay it open by Inciſion, deterging and healing as before. Laſtly, in dividing deep Fiſtulæ of theſe Parts, it may be proper to paſs a Canula like that at *Fig.* 11. *Tab.* XXXV. and then to inciſe with the Scalpel *Fig.* 13, but cautiouſly, to avoid injuring any other Parts.

Treatment of blind Fiſtulæ.

XIII. The third Claſs of Fiſtulæ in the Anus, are thoſe termed occult or blind, opening only into the Inteſtine internally. Theſe can never be cured without making an opening by an external Inciſion to come at the occult Sinuſes; the moſt convenient Part for making which Inciſion may be known either from its appearing with ſome Tumour, Hardneſs, Pain, or Redneſs and Inflammation; and eſpecially if, at the ſame time, the Finger perceives a Sinus, or ſoft Matter, like an Abſceſs under the ſame Part. When the Part to be inciſed is detected by the forementioned Signs, the Apertion thereof may be performed with a Scalpel or Abſceſs-lancet, the Patient being ſecured in the Poſture before deſcribed for cutting a Fiſtula, and for the greater Safety, to avoid injuring the Rectum, or adjacent Parts, the Index may be paſſed in the Anus, in order to preſs the Tumour outward during its Inciſion. By this means you are to convert an imperfect into a complete Fiſtula, to render the Cure thereof more practicable and certain; and, after the Apertion made, it may be further enlarged according to the Neceſſity of the Caſe, with an Inciſion-knife, either upon the Finger, or in a Director, carefully removing all the callous and vitiated Parts in the ſucceeding Dreſſings, which at firſt may be made only with dry Lint, Compreſs, and Bandage, compleating the reſt of the Cure according to our Directions before given for compleat Fiſtulæ; ſee Le Dran, *Obſ.* 82.

Another Method of proceeding.

XIV. But if none of the forementioned Signs appear, to direct the Surgeon to the affected Part to be inciſed; in that Caſe the Finger may be paſſed into the Rectum, either with or without the *Speculum Ani*, (*Tab.* XXXIV. *Fig.* 15.) in order to examine the State of the Fiſtula internally; which is to be done by paſſing up a large and flexible Silver probe bent, (as in *Tab.* XXXV. *Fig.* 14.) by the Side of the Finger in *Ano*, that the crooked Part of it may be by the ſame Finger directed and inſinuated into the Fiſtula, *Fig.* 1. G in performing which the *Speculum Ani* may frequently be ſerviceable. The Probe thus entered,

ed, is then to be diſcreetly thruſt forward in the Fiſtula, till its Head makes a Point or Protuberance externally near the Anus F, ſufficiently obvious both to the Sight and Touch; then the Surgeon is to cut down upon the Head of the ſame Probe with a Scalpel, till the Knife and that Inſtrument meet each other; after which the Head of the inflected Probe or Silver-wire is to be drawn a little way out through the external Wound, and further bent or brought together with its other End, ſo as to intercept the Parts to be divided, as repreſented by DD, and, to ſave double Trouble, the Surgeon may in ſhort paſs the Probe-end of a Syringotomus in this manner, inſtead of the Silver-wire, ſo as both to intercept and cut the Parts at the ſame time.

What is to be done after the Operation.

XV. But whatever be the Method taken to lay open and cleanſe Sinuses of the Fiſtula, the remainder of the Treatment ought to be conducted in the following manner: Firſt, the external Wound is to be well dilated, by filling it with dry Lint and Rags, which, in Caſe of a profuſe Hæmorrhage, ought to be previouſly dipt in ſome ſtyptic Powder or Liquor; and, in deep Fiſtulæ, the Doſſils of Lint and Rags thus inſerted, ſhould be bound with a Thread hanging out, to extract them by, leſt, if one ſhould be left behind, it might perpetually keep open the Fiſtula and fruſtrate the Cure. Theſe Dreſſings are to be retained with ſeveral, at leaſt three, thick Compreſſes, each larger than the other, the ſmalleſt to be applied firſt, as we directed for a *Prolapſus Ani*; and the Compreſſes again are to be ſuſtained by the T Bandage, made either of Linen-cloth, Callico, or Fuſtian, neatly and firmly applied; after which the Patient may be put to Bed, and, in Caſe of Fulneſs, when little Blood has been loſt in the Operation, a Vein may be opened, to prevent a ſupervening Inflammation. The firſt Dreſſings ſhould not be removed before the ſecond or third Day after the Operation, without the Patient has a Call to go to Stool; and even then the Dreſſings ought not to be haſtily undone, without great Urgency, ſince the Patient in this Diſorder has frequently a Teneſmus, or Inclination without any real Call. If ſome Parts of the Fæces are, at any time, forced into the Fiſtula in their Diſcharge, Care ſhould be taken to waſh them out with a Sponge and warm Wine, or together with dry Lint; with which laſt the external Orifice of the Fiſtula ſhould be all along dilated and kept open, that it may not cloſe before the Bottom, and other Parts are deterged and incarned, or healed. When any callous, or foul Parts appear in the ſucceeding Dreſſings, they ſhould be immediately treated with the Application of dry Lint, armed with ſome digeſtive Ointment mixed with red Precipitate, which ſhould be repeated till they are removed, and the Fleſh looks ſound and red, eſpecially towards the Bottom of the Fiſtula, which ought always to be firſt and principally cleared. But, above all, a ſtrict Regard ſhould be had for the firſt Fortnight, not to leave the leaſt Receſs or Sinus behind, which might fruſtrate the Cure, or occaſion the Diſorder to break out again; and the Diſcovery of Sinuses thus neglected, may be made partly by the Probe, and partly by the Quantity, with the Colour and Odour of the diſcharged Matter, which, when ſmall in Quantity, and of a laudable even Conſiſtence, is a Sign of Incarnation, which may be then promoted by the Application of mild Balſams and dry Lint. The Patient's Diet ſhould, in the mean time, be ſpare and temperate during the whole Cure, as well as for ſome time after; nor ought he in Strictneſs to be permitted the Uſe of any thing but Milk, Broth, Gellies, *&c.* that yield little or no Fæces, which

would

would greatly retard the Cure, by repeated fouling of the Parts, and ſtraining on the Stool, and alſo occaſion more than neceſſary Trouble, in often removing and renewing the Dreſſings.

Treatment of complicated Fiſtulæ.

XVI. Fiſtulæ of the Anus complicated with an Ulceration of the Bladder or Urethra, are of all the moſt dangerous, and difficult to cure, uſually proving inflexible to all Means. When a Fiſtula or Ulcer is alſo attended with a Caries of the *Os iſchium*, or *Os coccigis*; in that Caſe a free Opening or Communication muſt be made betwixt the Part affected and the Ulcer, that proper Remedies may be applied to remove the Caries, ſuch as *Eſſent. Ariſtolochiæ rotund.* which I have found excellent, with proper Mercurials, and a Decoction of the Woods given internally to depurate the Blood from ſcorbutic or venereal Infection; and when the Bone is once cleanſed by this means, and its Surface covered with new Fleſh, the remainder may be performed as in ſimple Ulcers. Thoſe Fiſtulæ, which are accompanied with an Ulcer of the Bladder, or Urethra, hardly ever admit of a Cure; except the Patient be of a good, healthy, and ſtrong Habit, and the Diſorder recent and ſuperficial; and then the Uſe of proper Internals, with external Detergents and Balſamics, may ſometimes have their deſired Effects.

Obſervations on Fiſtulæ.

XVII. I ſuppoſe my Readers are no leſs acquainted than myſelf, that there have been ſeveral other Methods propoſed by the Ancients [a], for treating Fiſtulæ of the Anus, *viz.* by the Uſe of Ligatures, with the Application of actual and potential Cauteries; which I here deſignedly omit, as being leſs ſucceſsful, and much more troubleſome, both to the Patient and Surgeon, than the other Methods of Treatment here delivered. But I muſt not forget to mention, that thoſe who have had their *Sphincter Ani* greatly corroded, or even only weakened by one of theſe Fiſtulæ, are very often troubled for the future with a perpetual Teneſmus, or Incontinency of their Fæces; when, on the contrary, the ſame Sphincter-muſcle may be divided or cut through ſeveral times, and healed again, without leaving any ſuch Symptom, when the Patient is robuſt, and ſuffers no Loſs of Subſtance in the Part. Sometimes the Operation of cutting is rendered impracticable in this Diſorder, either through the great Age and Weakneſs of the Patient, or the great Depth and Inacceſſibility of the Fiſtula itſelf; in which Caſe we muſt attempt to palliate the Diſorder, by mitigating its Pain, and other Symptoms, with Injections, and the Application of mild Balſams. But notwithſtanding the miſerable Condition of many Patients thus afflicted, we are told by Dionis [b], the *French* were ſo fond and proud of being in the Faſhion, when their King *Lewis* XIV. had a Fiſtula, that they boaſted of the Diſorder as a Point of Honour, and would even undergo the Operation, when there was no real Neceſſity.

Rules and Cautions.

XVIII. As the Treatment of this Diſorder makes a very difficult and important Branch of Surgery, we ſhall cloſe the preſent Chapter with adding a few Cautions for the better Management of the ſame: 1. In cutting deep and callous Fiſtulæ, the external Inciſion ſhould be much larger than the internal, that there may be a free Acceſs to cleanſe and dreſs to the Bottom of its Sinus;

[a] Hippocrates Lib. *de Fiſtulis*; Celsus Lib. 7. Cap. 4. §. 4. Ægineta. Albucasis Part. II. Cap. 80. where he mentions no other Remedy but the actual Cautery.

[b] In his Chapter on the *Fiſtula*.

and

and it may, in many Caſes, be adviſeable to make two Inciſions in a croſs manner, and then to extirpate the callous Parts at the Bottom and Sides of the Fiſtula by the Scalpel, or Sciſſars, the vitiated Part being held up by a Hook or pair of Pliers; for if the Fiſtula be not thus cleared, eſpecially at its Fundus, the Cure thereof will not ſucceed, or at leaſt it will be likely to break out again. 2. In order to avoid injuring the Rectum in cutting, it will be beſt to turn the Edge of the Knife from it, and to cut outwards towards the *Os iſchium*. 3. When the external opening of the Fiſtula is not near the Anus, but towards the middle of the Nates, its Sinus proceeding under the Skin towards the Rectum; the Sinus ſhould then be laid open by a Director and Inciſion-knife, or a pair of Probe-ſciſſars; dreſſing the firſt time with dry Lint, and leaving the further Examination of its Nature and Progreſs to the next Dreſſing. 4. When the Sinus appears to have perforated the Rectum, as in a complete Fiſtula, the Operation of cutting ſhould then be performed by paſſing the Probe-end of the Syringotomus, not through the Aperture, but to perforate the Inteſtine therewith, near a Quarter of an Inch above it; by which means, cutting into the Aperture, its callous Parts may be more eaſily removed, or cut off, which they ſhould be for about a Straw's Breadth all round, after the Rectum and its Sphincter are inciſed. 5. If a profuſe Hæmorrhage ſhould follow from the Diviſion of a large Blood-veſſel, it ſhould be taken up, if poſſible, with a crooked Needle and Thread; or, when that is impracticable, you may preſs down a Pledget, dipt in ſome Styptic, upon the Veſſel with your Finger for a conſiderable Time, near half an Hour or longer, till an Eſchar or Cruſt occlude the Orifice; obſerving in your Dreſſing to fill the Cavity well with Lint and Doſſils, retained by thick Compreſſes, and a pretty tight Bandage; beſides which it may in ſome Caſes be proper to order an Aſſiſtant to compreſs the Parts for ſeveral Hours with his Hand, the Patient being without the leaſt Motion; without which Precaution the divided Veſſels have ſometimes bled ſo profuſely into the Cavity of the Inteſtines, without any eſcaping by the Anus, as even to kill the Patient[a]. 6. When the Patient has not made water for ſeveral Hours after the Dreſſing, he ſhould be reminded thereof, leſt, by retaining his Urine too long, he might have a Suppreſſion, or a freſh Hæmorrhage from the violent Straining. 7. If a fiſtulous Patient has alſo the venereal Diſeaſe, the Cure of the laſt ſhould be accompliſhed before the other be undertaken, which will then frequently heal without cutting. 8. The particular Bandage for this Diſorder, contrived by M. Arneau, and recommended by Garengeot, we ſhall deſcribe at large in the third Part of our Syſtem following, upon Bandages. 9. And, laſtly, when the Wound made by the Operation begins to heal up, Garengeot adviſes a Tent of ſcraped Lint, like a Finger, to be ſpread with *Ung. Pompholig.* and to be thruſt into the Anus or Inteſtine, to forward the Cicatrization; but dry Lint alone will generally anſwer the ſame Intention with equal Advantage, and leſs Trouble. Uſeful Obſervations on this Diſorder may be read in Le Dran, *Obſ.* 82, 83, and 86.

[a] See Palfyn *Operat. Chirurg.* Cap. 20.

CHAP.

CHAP. CLXIX.

Concerning Abſceſſes *of the* Anus.

Deſign of this Chapter.

I. THOUGH we have ſlightly touched upon theſe Abſceſſes in the preceding Chapter; yet, as they generally prove the antecedent Cauſes of Fiſtulæ, and as a Knowledge of their Nature and Treatment will reflect ſome Light for the preventing and curing thoſe Diſorders, we ſhall here give them a ſeparate Conſideration.

Nature and kinds of the Diſorder.

II. The Formation of an Abſceſs in this part is ſometimes very ſudden, and proves critical; at other Times it increaſes very ſlowly, and almoſt inſenſibly, reſembling at firſt no more than a little Boil, which proves at length extremely painful and troubleſome to the Patient by its malignant Symptoms. The firſt Appearance of the Diſorder is often by a hard conical Protuberance, about the Size of a Filbert, beſet with a red Circle, or Inflammation of the adjacent Integuments, the external Skin frequently reſembling an Eryſipelas; and when the Parts are thus inflamed without any hard Tubercle, an Abſceſs will be ſometimes formed in the ſpace of four and twenty Hours. The Pain and Inflammation is ſometimes ſo great as to occaſion a Fever, with Thirſt, Reachings, Reſtleſſneſs, *&c.* As for the other kind of Abſceſs, which advances ſlowly, without any great Inflammation; though its Suppuration be alſo equally ſlow, yet it generally gives Pain enough to alarm the Patient long before it comes to a Head.

Progreſs of the Abſceſs.

III. But whatever be the manner of its firſt Formation, the Matter of the Abſceſs, when ſuppurated, always makes itſelf a way, by eroding the adjacent *Membrana adipoſa*, till it has either perforated the Inteſtine inwardly, or the Skin externally: And, in its Progreſs, it uſually makes various Sinuſes in the cellular Membrane, converting its included Adeps into a rancid and acrimonious Matter or Sanies; which eroding through the Inteſtine, external Skin, or both, we need not wonder that Fiſtulæ ſhould thence ariſe.

Examination of the Abſceſs.

IV. At the firſt Appearance of the Diſorder, it may be treated with diſcutient Fomentations and Cataplaſms, in order to diſperſe the Tumour before it ſuppurates; but when it is advanced too far, the only Benefit that can then be had, muſt be expected from the Knife, or an Apertion of the Tumour by Inciſion; in order to which its Suppuration ſhould be promoted as in other Abſceſſes. When the Tumour has loſt its Hardneſs and Pain, appearing ſoft, and yielding to the Touch, in order to open it, the Patient is to be placed in the ſame Poſture, as for the Operation of the Fiſtula in *Ano*, at Sect. VI. of the preceding Chapter; and, after this, the Finger is to be introduced into the Rectum, to know whether the Matter tends inwardly, when it does not point outwardly; but before the Surgeon makes his Inciſion, proper Care is to be always taken to bring the Matter of the Abſceſs to a due Degree of Maturation.

Maturation of the Abſceſs

V. The Maturation of theſe Abſceſſes may be greatly promoted by the repeated Application of a warm Bread and Milk Poultice, with a little Saffron, and a Plaſter of *Diach. cum gumm.* but ſuch Applications ſhould never be ſpread farther than the Part affected, nor be continued beyond their due Time; as that may ſpread the Diſorder, and make it penetrate to more important Parts. The Surgeon

geon ought not therefore to wait till the Matter of the Abſceſs points externally; but after the Cataplaſm has been uſed a few Hours, having cleanſed the Skin, he ſhould ſearch out the thinneſt Part of the Integuments, by preſſing with his Fingers of one Hand in the Anus, and with his others externally, that, by the pointing of the Matter, he may be directed where to make his Inciſion. For, to wait any conſiderable time, under a Notion of the Matter's coming to Suppuration, as ſome imprudently adviſe, would be to ſpread the Diſorder, and infect the adjacent ſound Parts.

Apertion of the Abſceſs.

VI. The thinneſt and moſt prominent Part of the Abſceſs being marked, and preſſed outward by the Finger *in Ano*, is then to be perforated in the middle, either with an Inciſion-knife, or Abſceſs-lancet, till the Matter flows out at the Apertion, which is to be further enlarged at Diſcretion, by elevating the Knife or Lancet in their Extraction; a proper Veſſel being alſo placed under the Wound to receive the Blood and Matter, which are to be gently forced out by compreſſing the circumjacent Parts with the Hands.

Enlargement of the Inciſion.

VII. The Matter being thus, either wholly or in part, diſcharged, the Apertion may then be more conveniently enlarged, by making a longitudinal Inciſion in the protuberant Lips; and, after examining the Nature and Progreſs of the Sinus with the Finger, another Inciſion may be made, traverſing the former in Form of a Croſs, or in any other Direction that may appear more convenient, always making the external Opening ſufficiently large, for the Conveniency of Dreſſing down to the bottom, and for the removal of the vitiated Parts.

Dreſſing.

VIII. For the Dreſſing of the Abſceſs, GARENGEOT adviſes to fill the Sinus with three or four Tents or Doſſils of Linen, each having a Thread annexed, of a different Colour, hanging out of the Wound, that, by this means, no Miſtake may be made, by drawing out the lowermoſt Doſſil before the others, which might occaſion an Hæmorrhage, or other bad Symptoms. Theſe Doſſils or Tents, he ſays, are to be again covered with ſeveral other Bundles of Linen; and thoſe, again, with ſeveral narrow Compreſſes, each a little larger than the other, as they approach nearer the Bandage; but, I muſt confeſs, I can ſee no Reaſon for thus loading the Part, in the Dreſſing of a common or ſimple Abſceſs. For my own Part, I fill the Sinus with Doſſils of Lint, and compleat the Dreſſing with Compreſs and Bandage, as in other Abſceſſes; nor do I force away the Lint in the ſubſequent Dreſſings, but treating the Sinus with ſome digeſtive Ointment, and a *Diachylon* Plaſter, I wait for the ſpontaneous Separation thereof by a Suppuration of the Surface; by which means I certainly avoid any profuſe Hæmorrhage. And, laſtly, I deterge the Abſceſs like as in Fiſtulæ of the Anus, and then heal with ſome vulnerary Balſam.

Treatment in Caſe of an Hæmorrhage.

IX. If any conſiderable Blood-veſſel be divided, if it cannot be ſecured by tying with a crooked Needle and Thread, a Compreſs dipt in ſome ſtyptic Liquor ſhould, in that Caſe, be applied and preſſed on the Veſſel with the Finger, till the Hæmorrhage ceaſes or abates, and then to fill the Part well with Doſſils of Lint, retained with ſeveral thick Compreſſes, ordering an Attendant to preſs his Fingers upon the Part of the Dreſſing oppoſed to the divided Veſſel, as we directed in Sect. XVIII. of the preceding Chapter. As for the Mundification, Incarnation, and Cicatrization, and compleating the Cure, the ſame Methods may be taken as for other Abſceſſes in general; but when the Abſceſs is formed in this Part from a venereal Cauſe, they generally become either fungous

or callous, and ſeldom yield to a Cure without the Aſſiſtance of Mercury; ſee LE DRAN's *Obſ.* 84 and 85.

M. GARENGEOT's Diſtinction.

X. We ſhall conclude this Chapter with obſerving, that GARENGEOT diſtinguiſhes Abſceſſes, like Fiſtulæ of the Anus, into complete and incomplete; and, notwithſtanding this Diviſion, when he comes to treat of their Cure, he has not a Word upon the latter kind, though in reality they deſerved a more particular Conſideration than the other, as may be inferred from what has been ſaid on this Diſtinction of Fiſtulæ in the preceding Chapter, whither I refer the Reader for what more might be here ſaid on that Subject.

An EXPLANATION *of the* THIRTY-FIFTH PLATE. *Relating to* Fiſtulæ *of the* Anus.

Fig. 1. Exhibits the two kinds of Fiſtulæ in the Anus: A A denote part of the *Inteſtinum rectum:* B the *Sphincter Ani:* C C a perfect or complete Fiſtula of the Anus, terminating with one Aperture externally, and the other in the Inteſtine: D D a flexible Probe or Silver-wire, paſſed through the two Orifices of the Fiſtula, and bent ſo as to come thro' the Anus E; the two Sides of the Wire intercepting the fleſhy Parts to be divided, are drawn gently outward, for the more ſafe and convenient Performance of the Inciſion. F repreſents an imperfect or incomplete Fiſtula, having only the Orifice G opening into the Inteſtine: H H denote the two Extremities or Heads of the Silver-wire.

Fig. 2. Repreſents an Inſtrument like a large Needle, from GARENGEOT, made of flexible Silver, having an Eye marked A for the Tranſmiſſion of a Ligature, when any one would by that means divide the Parts, according to the Advice of the Ancients, and it may alſo ſerve to convey a Slip of Linen through a Wound or Ulcer in the manner of a Seton: B the Point of the Inſtrument, which is to perforate the Inteſtine in an incomplete Fiſtula, and then to be inflected and brought out through the Anus; it has a Groove running through its whole length, by which it may ſerve to guide the Knife inſtead of a Director.

Fig. 3. Is a kind of Syringotomus taken in part from GARENGEOT's Treatiſe on Inſtruments (Tom. I. pag. 337.) A A A denotes the Concave and ſharp-edged Part for cutting, B B B its convex Back, which is obtuſe, C D the Silver-wire or Probe-end, which is flexible, and beginning at the letter C, terminates at the point D: The part marked E E being bent in form of a Hook, ſerves as a Handle to facilitate the cutting of a Fiſtula, when it is very hard or callous: F denotes where the Inſtrument terminated, as made according to my own Directions, without the Part D F, by which means it more commodiouſly performs its Office, than if it were of the whole length here repreſented.

Fig. 4, 5, 6, and 7. Repreſent ſeveral common Syringotomi of the Ancients, of different Sizes and Curvatures, and furniſhed either with obtuſe or ſharp Points, according to the different Circumſtances of Fiſtulæ; in theſe the Part which cuts is marked A B, C the Probe-end, D D the Convex and obtuſe Back.

Fig.

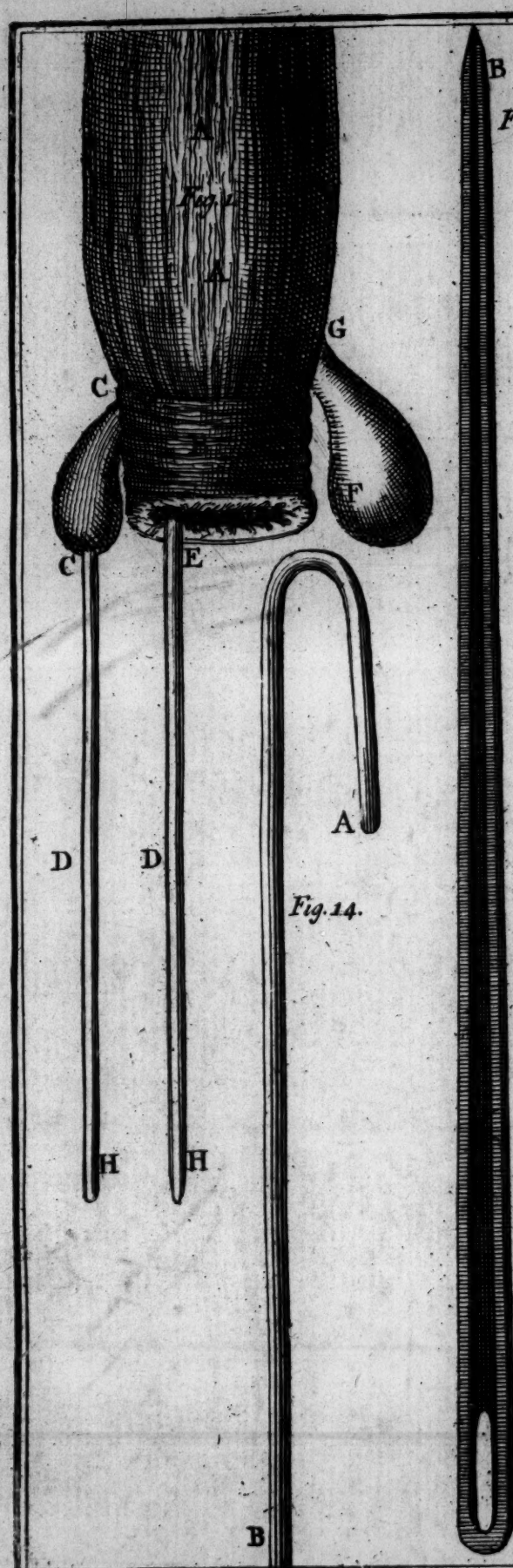


Fig. 2.

Fig. 14.

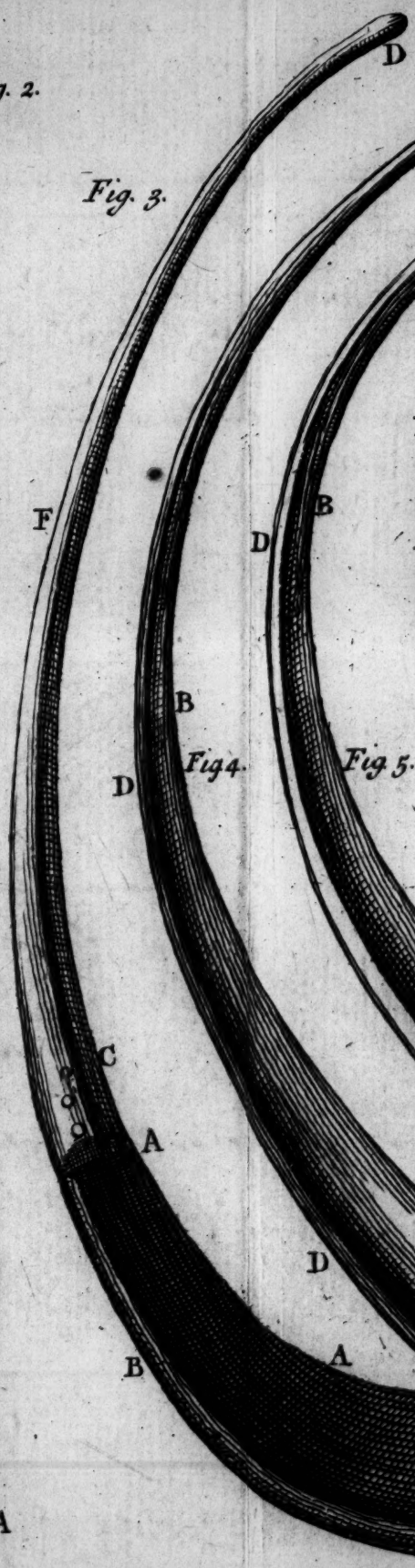


Fig. 3.

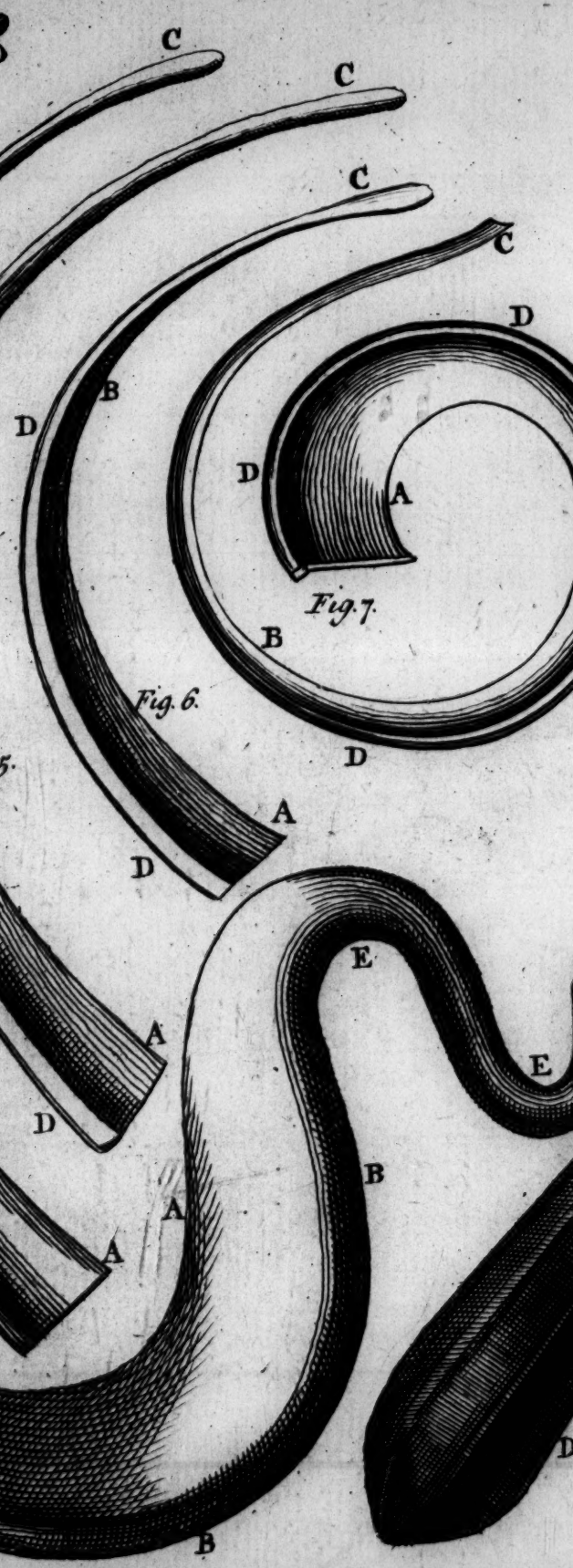
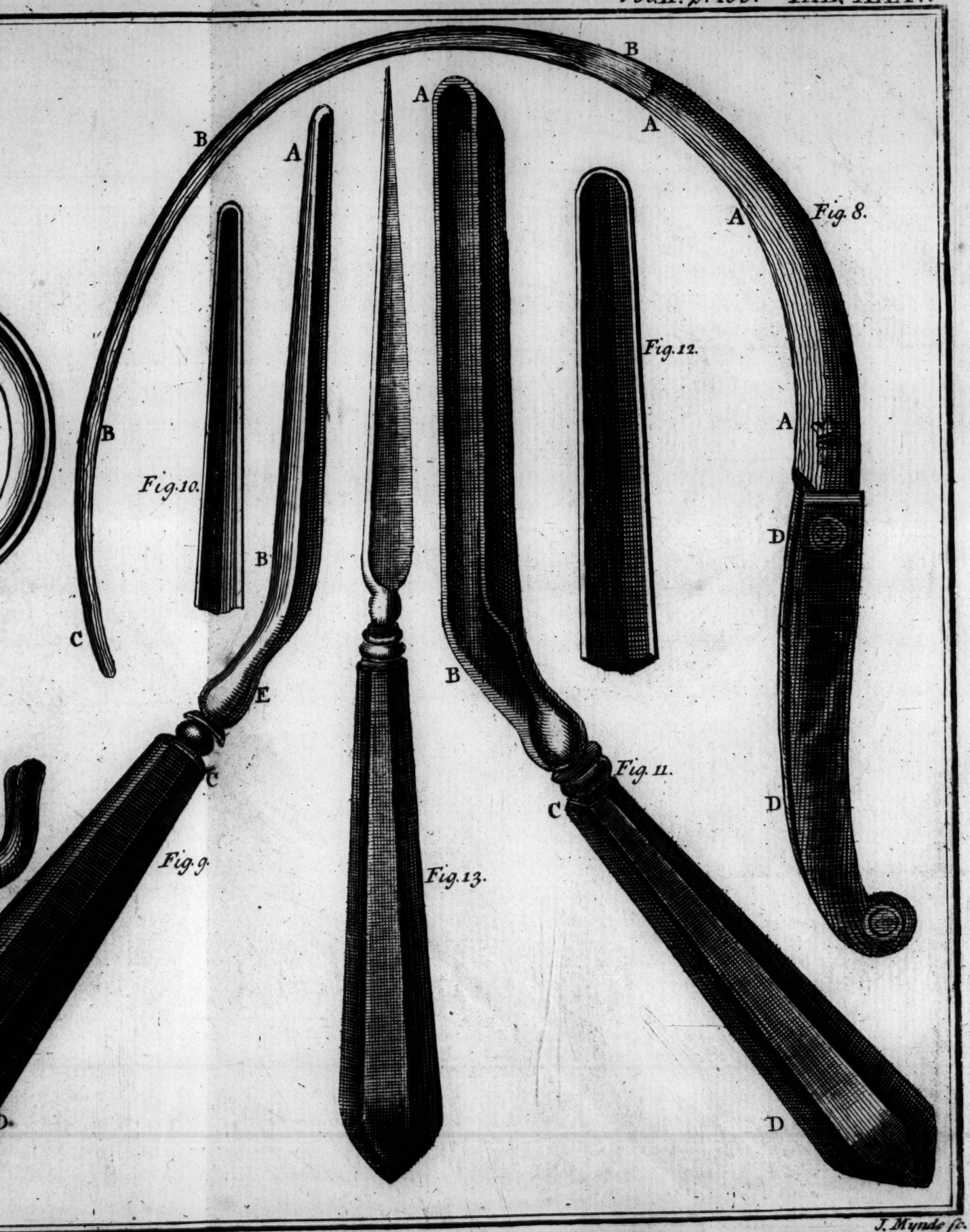


Fig. 7.

Fig. 6.

Fig. 4.

Fig. 5.



J. Mynde sc.

Fig. 8. Is a Scalpel or Syringotomus firſt publiſhed by Bassius: A A A denote the Edge of this Falciform Scalpel, B B the flexible Probe-end, made of Silver, C its Point, D D its Handle.

Fig. 9, 10, 11, 12, and 13. Repreſent the Inſtruments recommended to me for theſe Fiſtulæ, by Rungius, a Surgeon of *Bremen*. *Fig.* 9. A B its grooved Probe or Director, C D the Handle, E the Part where the Director is uſually bent according to the Nature of the Fiſtula: *Fig.* 10 gives a direct View of the Groove in the Director, as the preceding gave an oblique one: *Fig.* 11. A B is a Tube, or large Canula, to be paſſed into the Anus for the Reception of the Edge of the Knife, *Fig.* 13. in cutting the Fiſtula, that it may not injure the other adjacent Parts, C B its Handle inclined to the oppoſite Side: *Fig.* 12. gives a direct View of the Cavity in this Canula, that its Diameter may be the better diſcerned: *Fig.* 13. is a long and narrow Scalpel, which, in cutting for a Fiſtula, is conducted through the Groove of the Director *Fig.* 9. into the Cavity of the Canula *Fig.* 11.

Fig. 14. Exhibits a flexible Silver-probe or Wire, bent in ſuch manner that the Part A being introduced through the Orifices of the Fiſtula, and brought to its other End, form a ſpace for intercepting and extending the Parts of the Fiſtula to be inciſed.

PART II. SECT. VI.

Concerning Diſorders incident to the upper and lower Extremities, particularly to the Hands and Feet.

THOUGH we have conſidered moſt of the Diſorders which uſually happen in theſe Parts, as Wounds, Fractures, *&c.* in the former Part of our Surgery; yet we muſt not here omit to treat of a few which are more peculiar to theſe Parts, and which we have not yet examined; ſuch as the Paronychia, Ganglion, Suture of a Tendon, *&c.*

CHAP. CLXX.

Of the Paronychia, *or* Whitloe.

I. A Paronychia or Whitloe is an inflammatory and exceeding painful Diſorder, which infeſts all the Joints and particularly the Ends of the Fingers, which are generally much ſwelled, with a beating or throbbing, and intenſe Heat. There is ſometimes little or no Tumour obſerved, when the Diſorder lies deep at, or in the Bone; and ſometimes again the Tumor, Pain, and Inflammation are extended from the Finger up to the Elbow, or even to the Shoulder; from the Communication of the Fingers with thoſe Parts by their

Nature of the Diſorder.

Flexor Muſcles. Sometimes the Pain is ſlight and inconſiderable; but very often 'tis ſo exceſſive and tormenting, as to make the Patient lament Day and Night without a Wink of Sleep; and, in ſome Conſtitutions, it even excites a raging Fever, with Faintings, Convulſions, Delirium, an Abſceſs, or Sphacelus of the Part, and, without timely Aſſiſtance, Death it ſelf.

Kinds. II. As the Symptoms of this Diſorder vary in their Appearance and Malignity, according to the different Parts thereby affected, it has been therefore diſtinguiſhed by Surgeons into various kinds; of which GARENGEOT reckons four, and GOUEUS five; but, for my own Part, I cannot find any Ground for diſtinguiſhing more than three Species of the Paronychia. The firſt kind is when only the Integuments are affected at the End of the Finger, either in its Back or Fore Part, or near the Nail; in which Caſe the Symptoms are uſually not very malignant, though the Pain be extremely acute. The ſecond kind of Paronychia is, when the Perioſteum is inflamed or eroded, in which Caſe the Symptoms are more or leſs violent than in the preceding, in proportion as that very ſenſible Membrane is more or leſs violently affected. The third and worſt kind of this Diſorder is that infeſting the nervous Involucra, or Coverings of the Tendons belonging to the Flexor Muſcles of the Fingers, or even the adjacent Nerves, or Tendons themſelves; for, in that Caſe, the Diſorder often appears with the moſt excruciating Pains, and theblack Train of its moſt malignant Symptoms.

Cauſes. III. The true and proximate Cauſe of a Paronychia ought, in my Opinion, to be referred to an Inflammation of the adjacent Integuments, chiefly of the Perioſteum, from an Inſpiſſation of the Blood, or an Obſtruction of its ſmall Veſſels; which is alſo argued from the intenſe Heat and Pulſation of the affected Part. This Inflammation may again proceed from internal or external Cauſes acting ſeparately or combined; ſuch as an Inſpiſſation, or Acrimony of the Blood and Lymph, induced by a tenſe Fibre, and a heating Regimen, or an Abuſe of the Nonnaturals; joined with a Contuſion, Wound, or Puncture, or with the Stimulus of a foreign Body, as a Needle, Thorn, Splinter, *&c.* continuing to exaggerate the Part. So that a Paronychia is more dangerous and ſevere, in proportion to the Intenſity of the Inflammation, and Senſibility of the affected Parts. We are not ignorant, that ſome Phyſicians have attributed the Cauſe of this Diſorder to Worms, which appeared to the Eye upon making an Inciſion in the Part; but this is not often the Caſe, notwithſtanding the *Germans* frequently call this Diſorder by the Name of *Worms in the Fingers.*

Signs of the firſt Kind. IV. In the Beginning of the firſt Species of Whitloes, there appears a ſmall Tumour and Hardneſs in the affected Part of the Finger, but without any great Pain, which at length increaſes, and the Part begins to look red and inflamed. But though the Diſorder thus gradually advances in this Species, and the Tumour is much increaſed; yet the Pain is generally pretty tolerable, and not extended beyond the Finger, as it is in the other kinds of Whitloes. But the nearer the Inflammation approaches the Perioſteum and Tendons of the Fingers, the more intenſe is the Pain, which is ſometimes ſpread through the whole Arm.

Signs of the ſecond Kind. V. The ſecond Species of Paronychia is diſtinguiſhable from the former, in that the Pain is very intenſe, though confined to the Extent of the whole Finger, or barely its End; being ſometimes ſo ſevere as to excite a Fever, Reſtleſneſs,

neſs, Convulſions, Delirium, *&c.* without the Appearance of any great Tumour or Inflammation; nor does the Pain here extend itſelf up to the Elbow, as it does in the third Species of this Diſorder.

Signs of the third Species.

VI. The third Species of the Diſorder may be diſcerned by there being little or no Tumour at the End of the Finger, eſpecially when the Capſule of the Tendon is inflamed more in its internal than external Part. Here the Pain is ſo intenſe, that the Patient knows not what to do with himſelf; and, inſtead of the Diſorder being confined to the Finger, it ſpreads through the whole Hand and Arm; and particularly that Part of the Carpus which is inveſted with a tranſverſe and annular Ligament, continued even to the internal Condyle of the *Os humeri*, from whence the flexor Muſcles of the Fingers ariſe, though the Pain is even ſometimes extended to the Shoulder, with Fever, Convulſions, *&c.* If any corrupt Matter be lodged in the Capſule of the Tendon, it does not form any Appearance of Tumour at any Part of the Fingers, their Joints being in other Parts too denſe and compact. The Hand is uſually ſwelled more than the Finger, though with leſs Pain; and the Arm is ſometimes enlarged to ſuch a degree by it, that GARENGEOT has obſerved it as big as one's Thigh.

Event of the Diſorder.

VII. The Paronychia terminates variouſly according to its different Nature and Symptoms. That of the firſt kind is not very dangerous; but when the Parts affected are near about, or at the Root of the Nail, the latter generally ſeparates from the Finger, and with a good deal of Pain to the Patient; though ſometimes only that half of the Nail ſeparates, which is neareſt to the Whitloe, and when the Matter is lodged either under the Nail, or immediately next to the Tendon of the Finger, it then uſually gives the Patient intolerable Pain and Uneaſineſs. Thoſe afflicted with the ſecond Species of this Diſorder are in a worſe Condition than the former, as the Pain and other Symptoms are here more violent, ſo as ſometimes to put the Patient in Danger of his Life; tho' it very ſeldom arrives to that degree of Violence, as far as I have been capable of obſerving. Sometimes I have found a Caries take place in the Bones of the Finger, as a Conſequence of the preceding Inflammation and Suppuration; and when this is the caſe in the laſt Bone of any of the Fingers, which is a very ſmall one, a Cure may be ſooner effected by removing the whole, than to wait for an Exfoliation, which will ſcarce, or at all ſucceed in their ſpongy Texture. As for the third Species of the Paronychia, in that the Patient's caſe is the worſt of all, being really dangerous; for here the intenſe Pains, Abſceſs, Gangrene, Tumour, and Inflammation of the whole Arm, together with a Fever, and other malignant Symptoms, frequently deſtroy the Patient; unleſs prevented by a good Conſtitution, and a timely Aſſiſtance from Art. If in this Diſorder an Abſceſs ſhould be formed under the annular Ligament of the Carpus, near or upon the *Pronator quadratus* Muſcle of the Radius, GARENGEOT [a] then thinks it the Surgeons Buſineſs to declare the caſe incurable without Inciſion; and even then the Patient may be in danger of loſing the Uſe of his diſordered Finger, notwithſtanding the moſt prudent Treatment, and then the inevitable conſequences of the Diſorder, or Patient's Neglect and ill Habit of Body are often, by the malevolent, unjuſtly attributed to a want of care or judgment in the Operator.

[a] As GARENGEOT obſerves in his Chapter on the *Paronychia*; but with us the Caſe is ſeldom bad.

VIII. For

Treatment. by Medicines.

VIII. For the Cure of a Paronychia GARENGEOT propoſes Inciſion before any Trial has been made with other Remedies; but my Opinion is, agreeable to the Advice of HIPPOCRATES (§. VII. *Aph.* 6.) that the more gentle Means and Medicines are to be firſt uſed, before we have recourſe to the more ſevere and dreaded Help of the Knife; and the more ſo, as Experience demonſtrates, that many of theſe Diſorders (being ſlight or recent, and under good Circumſtances) are frequently diſperſed and removed, by the Uſe of diluent, diſcutient, and cooling Remedies, without an Inciſion in the diſeaſed Part, of which the Patient muſt be greatly afraid. The moſt approved Method for removing the Inflammation and Obſtruction in this manner, is to let the Patient hold his Finger for ſeveral Hours in *Sp. Vini* highly rectified, in which has been infuſed *Camphire* or *Theriaca*. For the ſame Intention may be uſed with Succeſs a Decoction *ex allio & fol. Scord. Sabin. M. in Lacte parat.* in which hot Liquor the Finger ſhould be either immerged for ſeveral Hours together, or elſe frequently fomented with it by Linen-rags. The *Pariſian* Academiſts (*Acta Ann.* 1707. p. 57.) recommend for this purpoſe, frequently to dip and hold the diſordered Finger a little while in ſcalding Water. Some applaud the Uſe of an *Aſſa fœtida* Plaſter, applied warm, and others recommend, as from Experience, the Application of the white Skin of a boiled Egg-ſhell, to which we may add, that RIVERIUS directs a frequent Intruſion of the diſeaſed Finger into a Cat's Ear, with Bleeding, and the Uſe of cooling Medicines. If the Patient finds Relief by any of thoſe Means, he ſhould perſiſt in the Uſe of them till the Finger is well, and without Pain; but when there is already a Suppuration actually formed, either before or under the Uſe of theſe Means, then indeed an Inciſion is the only Remedy. When the Patient is afraid to admit the lancing of his Finger, or when there is no Appearance of Matter formed, to direct the Inciſion, in the firſt kind of the Diſorder; a Suppuration may be then promoted by the Application of a Diachylon-plaſter with the Gums; but in the ſecond Species of the Paronychia, where the Perioſteum or Bone are affected; this Practice would be highly pernicious, as it muſt greatly increaſe the Pain and Diſorder, and induce an Abſceſs, Caries, a Gangrene of the whole Arm, and probably the Death of the Patient.

Operation for the firſt Species.

IX. In order to ſucceed in the Cure of a Paronychia, its particular Species is to be firſt accurately diſtinguiſhed. If it be of the firſt kind, and but ſuperficial in its Extent, its Cure may then be eaſily effected. As ſoon as the Surgeon perceives the Matter to point or form a little Protuberance, he ought immediately to hold and preſs it betwixt the Finger and Thumb of his left Hand, while he makes a longitudinal Inciſion therein with his right; by which means the Matter being diſcharged, the Finger will then heal almoſt of itſelf. HILDANUS (*Cent.* I. *Obſ.* 97.) propoſes the following, as a very ſafe and ready Method of curing this Diſorder, which he has made trial of with Succeſs. Firſt, he foments the Finger for ſome time in a Decoction *ex Flor. Chamam. Melilot. ſem. fœnugrec. & cydonior.* in Milk. Then gently cutting off the Surface of the Skin where Pain offers, he found ſome red Specks, which, being inciſed, afforded a Drop or two of a red Water, which, being wiped off, and the Wound dreſſed with Lint moiſtened in an Infuſion of *Theriaca* in *Sp. Vini*, the Pain quite vaniſhed, and the next Day the Finger was well without any other Remedy.

X. When

X. When the Diſorder happens either underneath, at the bottom, or on either ſide of the Nail, the Patient then generally loſes the whole, or ſome Part of it. If a purulent Matter lies concealed under the Nail, it uſually excites violent Pain and Inflammation, by eroding the adjacent Parts; it ought therefore, according to the Advice of SOLINGEN, and other expert Surgeons, to be diſcharged with all poſſible Expedition, either by cutting off the Nail, or by making an Inciſion into it, and, after preſſing out the Matter, the Wound may be dreſſed and healed with Lint dipt in *Sp. Vini, & Aq. Calcis.* Treatment of a Paronychia near the Nail.

XI. When the Matter ſpreads further or deeper under the Skin, the Intention is ſtill the ſame, to diſcharge it by Inciſion without Delay, leſt it affect the ſubjacent Bone before it erodes a Paſſage through the Integuments, which are in this Part more hard and impenetrable to it than in others. If the Patient be unwilling to have the Part inciſed, the Neceſſity thereof ſhould be laid open to him, by declaring the Conſequences, in order to bring him to a Compliance, and to clear the Operator from the Charge of Neglect or Miſconduct; and, in in the mean time, the Finger may be dreſſed with a Plaſter of Diachylon with the Gums, to promote the Suppuration. If the Skin ſhould break with the ſimple Application of the Plaſter, as is ſometimes the Caſe, the opening may be in ſome meaſure inlarged, and, when the Matter is diſcharged, and the Parts cleanſed, let the Dreſſing be with ſome digeſtive Ointment, or *Linimentum Arcæi*, made warm, and mixed with a little Spirit of Wine, with a piece of the forementioned Plaſter and a Bandage. But if the Patient ſubmits to the Operation, his Finger is then to be placed on a Table, with the affected part upwards, in which poſture it is to be held firm, together with the whole Arm by a robuſt Aſſiſtant, leſt the Patient ſhould flinch in the Operation, to the Detriment both of himſelf and the Surgeon, who, in the next place, proceeds to make an Inciſion with a ſtrong and ſharp-pointed Scalpel through the Integuments down to the Bone, even to the End of the Finger; by which means the ſtagnant Blood and Matter being ſet at Liberty, the Bone is in no danger of being thereby infected. When the Matter runs deep.

XII. In the ſecond Species of the Paronychia, when the Matter is contained between the Perioſteum and Bone, an Inciſion is then alſo to be made for its Diſcharge, according to the preceding Directions; only then more Care is to be taken, that the Knife penetrate to the Bone. If the Pain abates ſoon after the Operation, 'tis a good Sign of a ſpeedy Cure, notwithſtanding there might be little or no Quantity of Matter diſcharged; which is ſo ſmall as to be hardly perceptible in many Caſes. With regard to making the Wound or Inciſion, it is to be obſerved, that many Surgeons lay it down for a Rule, never to inciſe the fore or back Part of the Finger, but on one ſide of it, to avoid injuring the Tendons, which bend and extend the Internodes: But this appears to be a Caution unneceſſary; partly becauſe thoſe Tendons are not continued to the very Ends of the laſt Internodes, and partly becauſe we find by Experience, that the Finger may be ſafely inciſed in this manner. The lateral Method of Inciſion is however preferred, and ordered to be ſtrictly obſerved by GARENGEOT, but without the Addition of any Reaſon for it; he likewiſe adds, that if the Pain does not abate ſoon after the Inciſion has been made on one ſide, 'tis a Sign that the other ſide is affected; and therefore another Inciſion is to be there made. But my Advice is always to make your Inciſion on one ſide, when the Treatment of the ſecond Kind.

Pain

Pain and Tumour is diſcernible in that part, or when the Diſorder happens in the ſecond or third Internode of the Finger towards the Hand; but on the other Hand the Inciſion may be better made in the middle of the Finger's Ends, when the Matter points there, or when the Diſorder infeſts the whole Joint. Nor is the Infliction of two Inciſions, where one well made may be ſufficient, either conſiſtent with the Inclination of the Patient, or Reputation of the Surgeon.

Treatment after the Operation.

XIII. The Inciſion being made, the Blood ſhould be ſuffered either to flow out a little while of itſelf, or elſe it ſhould be preſſed out, to abate the Inflammation, and diſcharge what may be offenſive. In the next Place, the Wound is to be dreſſed with dry Lint and Diachylon Plaſter, with a Compreſs dipt in warm Spirit of Wine, each of them being cut in Form of a *Malta* Croſs, and retained by the Bandage proper for Diſorders of the Fingers. In dreſſing the Wound again the next Day, there generally appears a little ſpongy or proud Fleſh ſprouting out, which often alarms an unſkilful Surgeon without any Reaſon; for this is no bad Sign, and may be eaſily removed, either with the Sciſſars, or ſome eſcharotic mixed with digeſtive Ointment. The Wound is next to be treated like thoſe in which the Bones are affected, *viz.* with *Myrrh. Eſſent. Succin. Balſ. Peruv*, &c. And if the Bone is foul, the Wound ſhould be kept open with Lint dipped in *Tinct. Myrrhæ*, till there is an Exfoliation made of the morbid from the ſound Parts, or elſe till the whole Bone comes away entire, as is often the Caſe; after which the Wound may be deterged and healed without Difficulty, which would be impracticable ſo long as the Bone remains foul.

Treatment of the third Kind.

XIV. We ſhall now proceed to the Treatment of the third and laſt Species of the Paronychia, in which the Pain and Inflammation, or the malignant Matter is ſeated in the membranous Capſules, or Coverings, which inveſt the Tendons of the flexor Muſcles of the Fingers; which is a Caſe that has not often occurred to my own Obſervation, and was firſt propoſed by GARENGEOT, whoſe Advice is to treat it in the following manner: Firſt, the ſmall Tumour (which is diſcernible at the End of the Finger, partly by the pointing of concealed Matter in the Capſule, and partly by the Pain felt by the Patient) is to be opened, by making an Inciſion longitudinally down into the Capſule of the Tendon, which will diſcharge a kind of Lymph or Serum to the great Eaſe of the Patient; but notwithſtanding the Pain will return again in a little time. Sometimes the matter makes its own way without any Inciſion through the Skin and Capſule of the Tendon; and about its external Opening appears a very ſenſible Caruncle, or fleſhy Subſtance, which is conſtantly moiſtened with the diſcharged Humour. In this laſt Caſe he adviſes to paſs a Director through the external Opening into the eroded Capſule of the Tendon, and then to make an Inciſion through the Parts incumbent on the Director, by which means a thicker Matter will be found concealed in the divided Sinus. If the internal Sinus of the Paronychia is in the middle Part, or ſecond Joint of the Finger, and is laid open ſo far by Inciſion, in that Caſe M. PETIT adviſes to continue the Inciſion, even down for above a quarter of an Inch into the Hand, in order to free the Tendon from the Stricture received from the Tenſion of the Parts below, where the Capſule is ſometimes become callous, or much indurated; for if the Capſule be yet ſoft and diſtractile, it will yield to the confined Humours without preſſing the Tendon.

XV. When

XV. When the Diſorder or Matter has reached the membranous Part of this Capſule of the Tendons, which expands itſelf from under the annular and tranſverſe Ligaments of the Carpus up to the Cubitus, and when the ſaid Matter begins to convert the Adeps upon the *Pronator quadratus* Muſcle of the Radius into *pus* or *Ianies*; in that Caſe the Director is to be gradually inſinuated, and the Parts inciſed upon it down to the annular Ligament; which done, the Patient's Hand is to be bent to relax the Parts, and then the Director conveyed under the ſaid Ligament, making an Inciſion or Aperture, by cutting down into the Groove of the Director on the other ſide of the Ligament, which itſelf ſhould be left entire. The Aperture thus made, and ſufficiently enlarged, the Matter will be more eaſily diſcharged, and you may have a better View of the Sinus or Abſceſs, in order to which you ought alſo to make a gentle and gradual Separation of the Tendons as much as poſſible from each other at the Carpus. In the next Place M. GARENGEOT informs us, that it is the good Advice of M. THIBAUT, who was lately a celebrated Surgeon at *Paris*, to paſs a Ligature by a Probe through the two Apertures as in a Seton; by which means the Matter may be cleanly diſcharged, and the Ulcer deterged without dividing the Ligament. But if the Fever, Pain, and other Symptoms, do not abate by this Procedure, M. PETIT adviſes immediately to divide or cut off that Tendon, which is moſt diſordered, cloſe to its muſcular Fleſh above the annular Ligament, by which method he aſſerts, the Pain has inſtantly abated, and the Patient been happily cured: He alſo thinks that the tranverſe Ligament of the Carpus ſhould be ſerved in the ſame manner, when that is inflamed, or eroded by purulent Matter, ſo as to excite moſt acute Pains; the Succeſs of which Practice is confirmed by the Inſtances of M. ARNAUD, formerly an eminent Surgeon of *Paris*. When the Director cannot well be paſſed under the annular Ligament for this purpoſe, an Inciſion ſhould be made betwixt the Artery on the Radius, and the Tendons of the profundus and ſublimus Muſcles [a]; by which Inciſion, being ſufficiently enlarged, the confined Matter is to be prudently evacuated, and the State of the Sinus examined. To recommend this Practice to us, GARENGEOT relates the Caſe of a Patient of ARNAUD's, who had this Diſorder in ſuch a deplorable manner, that ſome Surgeons judged the Arm ought to be amputated, and others, that the Patient could not long ſurvive it; but, upon M. ARNAUD's dividing the tranſverſe Ligament, all the Symptoms diſappeared in a ſurprizing manner, and the Patient was quickly cured. But it is here a very neceſſary Caution to obſerve, that the Patient's Hand be neither extended during the Operation, nor for ſome time after; for when the Hand and Carpus are in an inflexed Poſition, the divided Ligament will more readily unite, and the Hand recover its uſual Motion; but if they be imprudently extended, the Tendons under the divided Ligament will ſtart out of their Places, and perhaps not only hinder its uniting, but alſo impede or deform the proper motions of that Member for the future.

Treatment of a Paronychia, which penetrates into the Hand.

XVI. Having finiſhed your Operation in this manner, your next Buſineſs is to proceed to the Dreſſings, which are to be made when any of the Capſules of the Tendons are opened, firſt with ſeveral Doſſils of dry Lint, of an oblong

The Dreſſing.

[a] I once opened a large Abſceſs in this Part near the radial Artery; but it had no Communication with the Fingers, nor the Capſules of their Tendons.

Form, and laid on each ſide the Tendon, to ſuppreſs the Hæmorrhage by compreſſing the divided Veſſels; but if any very large Blood-veſſel be divided, and bleeds profuſely, it ſhould be taken up with a crooked Needle and Thread; for it is not ſafe here to apply cauſtic and ſtyptic Remedies for this End, as in other Wounds. In the next Place, the Hand and Arm are to be wrapped up to the Elbow in a warm, emollient Cataplaſm, retained by the Bandage of eighteen Heads, *Tab.* 9. *Fig.* 4. BB. The Advantage of which Bandage over the long ones, may appear from your being thereby enabled to apply, and renew the Dreſſings at Pleaſure, without moving or diſturbing the Parts. Laſtly, to render the Dreſſing as compleat as poſſible, you ought to apply the entire Part of the Bandage to the ſound Part of the Limb oppoſite to the Wound; by which means the Dreſſings will be more firmly and effectually retained upon the affected Parts.

CHAP. CLXXI.

Of Ganglions, *or Knots of the* Tendons.

Deſcription. I. A *Ganglion* is, by our modern Surgeons, underſtood to be a hard Tubercle, generally moveable, in the external or internal Part of the Carpus, upon the Tendons or Ligaments in that Part, but uſually without any Pain or great Uneaſineſs to the Patient. The *Germans* term the Diſorder *Oberbein*, i. e. *Hyperoſtoſis*; either becauſe this kind of Tumour is ſeated on a Bone, or from its reſembling that Body in Hardneſs. Though Ganglions ſo nearly reſemble Tumours incyſted (conſidered in Chap. XXVIII. preceding), that CELSUS, *Lib.* 7. *Cap.* 6. makes them one and the ſame; yet their Difference may appear, if it were only from their different Seats; Ganglions being confined to the Tendons and Ligaments of the Hands and Feet; but incyſted Tumours are not reſtrained to any Part of the Body. However, it is to be obſerved that ſome, even of the Moderns, call a ſimilar Species of hard and moveable Tubercles in the Head, and eſpecially the Forehead, by the Name of Ganglions; as you may ſee in a profeſſed Diſſertation, *de Ganglio*, publiſhed at *Altorf*, *Anno* 1717.

Cauſes. II. With regard to the Cauſes of Ganglions, they ſeem generally to proceed from an Inſpiſſation of the viſcid Juices which are let out, and lodged betwixt the Fibres and Membranes, when the Tendons and Ligaments of theſe Parts have been injured by a Fall, Blow, Strain, Contuſion, Luxation, or the like; in which Caſe they gradually increaſe more or leſs, as long as the Fibres yield, the Juices find Vent, ſo as to advance to the ſize of a Filbert, Nutmeg, Walnut, or even a Pigeon's Egg. BLANCARD mentions that RUYSCH found a Ganglion in a dead Subject like a pellucid and cryſtalline Humour; ſimilar to which, I ſaw my Son cut out one, the Size of a Nutmeg, from the Back of the Wriſt of a young Woman at *Helmſtadt*, in the Year 1736. To which we may add, that the noted CYPRIANUS [a] has taught us, that they proceed from a kind of Lymph, like the White of an Egg, which is retained and inſpiſſated in the

[a] Lib. *de Fœtu è Tuba Fallopiana exciſo*, pag. 76.

Capſules

Capſules of the Tendons, without coming to Suppuration; which is alſo conformable to what I have frequently obſerved myſelf.

III. If we attend to the Differences or Kinds of Ganglions, we ſhall find a very great Variation, as well in their Size, which we before mentioned, as in their Number, Figure, and other Circumſtances. Sometimes there is but one, ſometimes ſeveral, and in each Hand; as we have a notable Inſtance in the *Miſcellanea Acad. nat. curioſ. Dec.* I. *Ann.* 3. *Obſ.* 326. Some are oblong, round, or oval; with an equal or unequal Surface. Some of them, which are recent, may be eaſily diſperſed; and others, which have been of long ſtanding, hardly yield to any Remedies but the Knife. Kinds.

IV. The inſpiſſated Matter of a recent Ganglion may often be happily diſperſed, barely by rubbing the Tumour well every Morning with the faſting Saliva, and binding a Plate of Lead upon it afterwards for ſeveral Weeks ſucceſſively. Many attribute a ſtronger diſcutient Virtue to the Lead, when it has firſt had ſome Mercury rubbed upon it; and others, with leſs Reaſon, prefer a Bullet that has killed ſome wild Creature, eſpecially a Stag. Some, with Forestus[a], adviſe the Uſe of *Emplaſt. de Ammoniaco vel de Ranis cum Mercurio*; and often to rub them well with *Ol. Saponis, Philoſophorum, vel Petrolium.* Sometimes indeed a recent Ganglion will ſpeedily vaniſh by the Uſe of theſe Diſcutients, eſpecially by adding a repeated Preſſure on them with all one's Might by the thumb[b]. Meekren writes, that a Cure may be readily performed, if the Patient frequently lays his Hand on a Table, and ſtrikes on the Tumour with his Fiſt; ſee *Tab.* XXXVI. *Fig.* 1. And this ſeems to be the Reaſon why Muys aſſerts, that an inveterate Ganglion, which cannot be diſperſed by Medicines, may yet be diſſipated by frequent beating with a Stick, or a wooden Mallet armed with Lead. We alſo read, that Helvetius made uſe of a wooden Hammer for this purpoſe. But, in this Operation, Care ſhould be taken not to injure the Bones, Tendons, or other Parts of the Hands, when you ſtrike the Tumour; for that might occaſion the very ſame, or a worſe Diſorder. If none of theſe means prove effectual, it will be neceſſary to remove the Tubercle, either by Inciſion or Cauſtics, as we have propoſed for incyſted Tumours, in Chap. XXVIII. They may be ſafely removed by Inciſion, provided you are careful to avoid the adjacent Tendons and Ligaments; as may appear from Solingen, in *Part.* IV. *Chap.* 14. of his *Surgery*; and I have myſelf ſeveral times happily removed them this way. But as for rubbing them with the Hand of a dead Man, and the like ſuperſtitious Ceremonies, they are of ſo little Conſequence, and founded on ſo weak a Baſis, that, I preſume, my Reader will readily excuſe me from inſiſting on them. Cure.

[a] *Obſ. Chirurg.* Lib. 3. Cap. 9.
[b] See Ætius *Tetrab.* IV. Serm. III. Cap. 9. and Muysii *Prax. Chirurg.* Dec. II. Obſ. 8.

CHAP. CLXXII.

The Suture of Tendons in the Hands.

Design of Sutures of the Tendons.

I. THE Suture of Tendons in the Hand is, by our modern Surgeons, performed, in order to join them when they have been cut aſunder, that the Fingers, to which theſe Tendons belong, may not grow ſtiff, or loſe their motion. This Operation of joining the divided Tendons by Suture, may be peformed without much Difficulty, when they are ſeated ſuperficially, or near the Skin, like thoſe Tendons on the Back of the Hand, which ſerve to extend the Thumb and Fingers; as alſo thoſe on the Backs of the Fingers themſelves[a], as well as on the Backs of the Hands; to which we may add, the Tendons of the Flexors of the Fingers[b], which run on their Inſides, with thoſe of the Flexors and Extenſors of the Hand near the Carpus[c]; in the Leg we include the Tendons in the Ham[d], with the Tendon of the *Extenſores Tibiæ* below the Knee, and the *Tendo Achillis*[e] above the Heel, *&c.* Whereas the Tendons, in the Palm of the Hand are ſo deeply ſeated, that I cannot find one Inſtance of their being joined by Suture. It is obſervable, that this Practice has lain neglected by almoſt all the Ancients, in Conformity to the Saying of HIPPOCRATES (*Aph.* 19. Sect. VI. and *Aph.* 28. Sect. VII.) "that a Nerve or Tendon, be-"ing cut aſunder, can never grow or unite again afterwards," which gave them an Averſion to this Operation, inaſmuch as a ſlight Puncture in a Tendon often excites the moſt grievous Symptoms; yet that there were ſome, in the Time of GALEN, who practiſed this Suture of the Tendons, may be concluded from his adviſing againſt it[f]; which Advice was rigidly adhered to by the generality, and particularly AMB. PAREY. However, this Operation has been ſufficiently conſidered, and approved of by the *Arabian* Phyſician AVICENNA[g], GUIDO DE CAULIACO[i], SALICETUS[k], ROGERIUS[l], LANFRANCUS[m], BRUNUS[n], CHALMETEUS[o], ANDREAS A CRUCE[p], and others, among the ancient Sur-

[a] See a *French* Treatiſe, intituled, *L'Art de faire rapport en Chirurgie.* pag. 194, and 195. See alſo VERDUC on *Chirurgical Operations*, Chap. 32.

[b] See MEEKREN *Obſ.* Cap. 65.

[c] PAREY, in his *Surgery* (Book 9. Chap. 36.) relates, that theſe, and other Tendons of the Limbs, have been ſewed together by ſome Surgeons; but that he never durſt undertake it, for fear of exciting Pains, Convulſions, and other bad Symptoms.

[d] VESLINGIUS tells us, (in *Obſ. & Epiſt.* XV.) that he ſaw theſe two Tendons joined by Suture.

[e] We have an Account of the Tendons belonging to the Flexors of the Carpus being happily joined by Suture, in WEPFER Lib. *de Cicuta Aquat.* p. m. 92 and 93. And a Suture of the Tendons belonging to the *Supinator longus* and *ſublimus* Muſcles in STALPART VANDER WIEL, Cent. II. Obſ. 45.

[f] Lib. III. *de Comp. Medicament.*

[g] Lib. 9. Cap. 36.

[h] Lib. 4. Fen. 4. Tract. 4. Cap. 2.

[i] Tract. 3. Cap. 4.

[k] Lib. 2. Cap. 9.

[l] Lib. 3. Cap. 13.

[m] Lib. 2. Cap. 9. Doct. 3. Cap. 3. and in *Chirurg. parv.* Cap. 4.

[n] Lib. 1. Cap. 5.

[o] *Enchirid. Chirurg.* Lib. 2. Cap. 11.

[p] Lib. *de Vulner.* Tr. 2. Lib. 2. Cap. 8.

geons;

geons; and yet, notwithſtanding this, the Practice has been either unknown, or elſe unreaſonably rejected as dangerous by their Succeſſors, till at length VESLINGIUS[q] and SEVERINUS[r] revived it in the laſt Century, after whom it was brought into practice by FELIX WURTZ[s], who was ſeconded by many other celebrated Surgeons; particularly MAYNART[t] and BIENAIS[v] of *Paris*, with PURMANNUS[w], and others[x]. This Operation ſucceeds beſt when the Wound is recent, or lately inflicted; but may be alſo undertaken with Succeſs on the ſecond, third, or fourth Day after the Accident; but the Difficulty is much greater to make a Suture of the Tendon, when it has been ſo long neglected as to let the Wound heal up; but that it is then alſo practicable, may appear from Experience, and the Writings of many able Surgeons[y].

When the Suture is to be undertaken.

II. Before the Operation be undertaken, it will firſt be proper to conſider, whether it may be neceſſary or practicable in the Patient's Caſe; for Tendons are frequently divided in Parts, ſo as to be inacceſſible to the Needle, and ſometimes the Suture cannot be performed on them without great Danger; and, in ſome other Caſes, it may be practicable, and not neceſſary, as when the Tendons may be brought and retained together by Compreſs and Bandage without Suture; but if a conſiderable Part of the Tendon is cut off, or deſtroyed, or its Parts recede much from each other, and lie concealed betwixt the adjacent Muſcles, ſo that the two Ends cannot be brought together, it will then be in vain to attempt the Operation. Nor can the Suture of a Tendon ſucceed well, if its Ends are violently contuſed, as the conſequent Inflammation, Suppuration, and other malignant Symptoms, will prevent their uniting and healing, and make the Symptoms be rather exaggerated by a Suture. In ſuch a Caſe, it is therefore more adviſeable, as GARENGEOT obſerves, to wait till the Inflammation and other Symptoms are removed, and to promote a Separation of the unſound Parts before you venture to uſe the Needle. The ſame Author alſo obſerves, after SOLINGEN, that the Tendons of the Extenſors in the Back of the Hand may generally be united without Suture, by bringing and retaining the divided Ends to each other, the Fingers being all the time extended out a little backwards, with Bandage and Compreſs, by the Uſe of which I have ſeveral times joined divided Tendons without any Suture, and particularly I ſucceeded this way in a Lad, who had all the Tendons of the Extenſors of his Fingers divided on the Back of his Hand. Therefore the Surgeon need not give himſelf the Trouble, nor

[q] *Obſervat.* and *Epiſt.* XV. where he tells us, that he ſaw this Operation performed, not only with Aſtoniſhment (thinking it a raſh Undertaking) by the *Arabian* or *Turkiſh* Surgeons, but alſo upon a Servant of his Father's in *Germany*.

[r] *De Efficaci Medic.* Lib. 2. Cap. 123.

[s] *De Vulnerib.* Cap. 14.

[t] See MEEKREN *Obſ.* 65.

[v] VERDUC, VAUGION, and DIONIS, attribute the Revival of this Operation to BIENAIS; but ſay nothing of MAYNART, who performed it at *Paris* in the middle of the laſt Century.

[w] This Author aſſerts, in his *Chirurgia Curioſa*, that he has above a dozen times happily joined divided Tendons by Suture with a crooked Needle; and the ſame he alſo aſſerts in his *Chirurgia Caſtrenſis*, pag. 100.

[x] ETMULLER tells us, he ſaw this Operation performed at *Paris* in 1665, or 1666, without mentioning by whom; and various Inſtances and Obſervations in this kind of Suture, and other Diſorders of the Tendons, may be ſeen in STALPART VANDER WIEL, *Obſ.* 45. Cent. II.

[y] This is aſſerted by VERDUC and LE CLERC, in their Treatiſes of *Chirurgical Operations*, Chapter on the *Suture* of a Tendon; but it is denied by DIONIS.

his

his Patient the Pain of making a Suture, when the Tendons of the Flexors, or Extenſors of the Fingers or Toes, are divided, ſince they may be brought to unite, by retaining them together with Splints, Compreſs, and Bandage. But when a Tendon is punctured, contuſed, or but half divided, and Convulſions, with other malignant Symptoms follow; if they cannot be removed by proper Remedies (ſuch as *Ol. Terebinth, cum guttulis paucis Ol. deſtillat. ſuccin. aut Lavend.*[z]) it will be then neceſſary to make a total Diviſion of them, and, when the Symptoms are vaniſhed, to join them together again by Suture.

The firſt kind of Suture.

III. The Method of uniting divided Tendons by Suture is as follows: In the firſt Place the wounded Member is to be inflected or extended, that the two Extremities of the Tendon may meet each other; but if the upper End of the Tendon, attached to its Muſcle, be contracted and drawn under the Skin, in ſuch a manner, that it cannot be drawn down, or entered by the Needle, in that Caſe an Inciſion is to be made to take hold of it with the Pliers, drawing it gently downwards; but GARENGEOT thinking this Treatment too rough, draws down the Tendon by paſſing a Needle and waxed Thread through it, though the ſame may be done gently with the Pliers, without any ill Conſequences. But, before we proceed any farther, it muſt be obſerved, that there are two Methods of making the Suture, either with one, or with two Needles: The firſt Method, with one, is by threading a ſmall, ſtraight, and common Needle, either, flat, or round at the Point, (*Tab.* XXXVI. *Fig.* 2. A A) with ſlender, but ſtrong and double Thread or Silk BB, being waxed, armed with a large Knot marked C. This Needle and Thread are to be paſſed through a bit of Leather D, up to the Knot C, that the ſaid Knot may not eaſily ſlip through the Tendon; ſee *Fig.* 4. A, and *Fig.* 7. DE. The wounded Hand is in the next Place to be extended flat upon a Table, or faſtened in that poſture to a Ferrula, or a piece of Paſteboard, that the divided Ends of the Tendons on the Back of the Hand, *Fig.* 4. may meet together, and then the armed Needle is to be paſſed through the middle of the upper end of the Tendon, a little more than the tenth of an Inch from the Edge where it was divided, and applying a ſtitching Quill or Canula, (*Tab.* VIII. C.) to the oppoſite Side of the Tendon, the Needle is to be entered from without towards the internal Part of the Leg, as in *Tab.* XXXVI. *Fig.* 4. A; after which it is to be paſſed in like manner through the lower End of the divided Tendon B; but with this Difference, that here the Needle paſſes outward, and then placing a ſmall Compreſs of Linen, Silk, or ſoft Leather[b], either dry, or ſpread with Cerate, under the Thread as in the knotted Suture, *Tab.* II. *Fig.* 22. the Thread is now to be tied thereon with a ſingle Knot, and then with another Slip-knot, as repreſented by the Letter B. Laſtly, after the Wound has been cleanſed, it is to be dreſſed with *Balſ. Capiv.* or ſome other vulnerary Balſam, applied warm with Lint and Compreſſes, faſtening under the whole a Ferrula, or piece of ſtiff Paſteboard, adapted to the Form of the Hand, *Fig.* 5. with Compreſſes, to elevate the Fingers, concluding the Opera-

[z] *Ol. Tereb. cum Aq. Hungar. miſſ.* is alſo excellent: DUVERNEY recommends *Balſ. Capiv. cum Ol. Ovor.*

[a] Some uſe a thin Plate of Lead inſtead of Leather, (as MEEKREN, *&c.*) others, as VERDUC, uſe a ſmall Linen Compreſs.

[b] MEEKREN obſerves, that a crooked Needle was uſed by MAYNART, and the Needle figured by DIONIS is crooked.

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tion with a proper Bandage. It is to be obſerved, that a ſmall crooked Needle may be alſo uſed for this Operation, like that repreſented at *Fig.* 6. having a flat Point. If the Needle paſſes difficultly through the Tendon, you may uſe the Inſtrument *Tab.* VI. *Fig.* 3. If the Wound has been inflicted ſeveral Days before, and the Ends of the Tendon are become indurated, it may then be proper to cut off juſt the indurated Surface with a pair of Sciſſars, before they are joined together by Suture, that they may the more ſpeedily and intimately coaleſce or unite; or, if the Wound is in part healed up, or the Tendon adheres, an Inciſion and Separation is to be cautiouſly made, to ſet the Tendon at liberty before the Operation.

IV. M. GARENGEOT thinks he has improved and corrected the preceding general Method of performing the Suture of a Tendon, which he propoſes in the following manner. He thinks the Tendon ought not to be laid bare, nor pinched with a pair of Pliers; but rather it ſhould be joined together with the external Integuments by Suture, according to the Directions which we have before given for that purpoſe in Wounds. But GARENGEOT is not the firſt Starter of this Obſervation; for CHALMET [c] long before taught, that when a Nerve or Tendon was cut through tranſverſly, it ought to be reunited if poſſible, together with the adjacent Fleſh, by Suture, which is alſo the Advice of VERDUC and CHARRIERE. But, to effect the Operation with more Eaſe, M. GARENGEOT adviſes the Uſe of the ſtitching Quill, *Tab.* VI. *Fig.* 3. by the Aſſiſtance of which the Needle may be better conducted through the Lips of the Wound, than by the bare Fingers. A crooked Needle with a flat Edge, *Fig.* 6. is here preferred before the common crooked Needle, whoſe Point or Edge is angular, *Tab.* I. S T U; becauſe the firſt ſort of Needle does not divide ſo many Fibres of the Tendon, as the laſt. When the greateſt part of the double Thread has been paſſed through the Integuments and Tendon, a Compreſs of Silk ſpread with cerate, and convoluted into a Cylinder, is to be applied in it, as in a loop, for ſuſtaining the Ligature on the Lips of the Wound, as at *Tab.* XXXVI. *Fig.* 4. C; and, when the Thread has been paſſed in like manner through the lower part of the Tendon, the two Parts being drawn together, ſo as not to ride over each other, and a cylindric Compreſs placed betwixt the Thread, the whole is then to be ſecured with two Knots, the one a ſingle, and the other a ſlip Knot. But it ſeems to me a little ſurprizing, that GARENGEOT ſhould adviſe with VAUGION, VERDUC, CHARRIERE, and DIONIS, that the divided parts ſhould ride over each other, when that muſt apparently impede the Agglutination; and, upon which account, it has been juſtly rejected by the ſkilful Anatomiſt and Surgeon Mr. COWPER, who happily reunited the *Tendo Achillis* by Suture, without obſerving this Circumſtance [b]. This kind of Suture may be alſo conveniently made with two ſquare bits of leather applied to each end of the Thread and Compreſs under the Knot, as in *Fig.* 3. A B, and *Fig.* 7. The kind of Suture for Tendons deſcribed by DIONIS is, of all the Methods, the moſt ſimple, reſembling the Suture we have propoſed for common Wounds, *viz.* to paſs a convenient Needle, armed with a ſingle wax-

GARENGEOT's Method.

[a] *Enchirid. Chirurg.* Lib. 2. Cap. 11. publiſhed at *Paris* in 1564. CHALMET prudently adds, *if poſſible*; for the Tendon is frequently ſo much drawn up, as to leave a ſpace of two Inches, as Mr. COWPER relates.

[b] *Phil. Tranſ.* N° 252. LOWTHORP's Abridgment, Vol. III. pag. 298.

ed Thread through the middle of the upper end of the divided Tendon from without inwards, and then to paſs it through the other end from within outwards at one Stitch; after which, the Needle being removed, the Thread is to be drawn, ſo as to conjoin the two ends of the Tendon, and then tied upon a round Compreſs. But the preceding Methods are generally preferred before this.

The Suture with two Needles.

V. The Suture of a Tendon by two Needles was firſt deſcribed, as far as I can find, by NUCK, who directs two Needles to be paſſed one through each end of the divided Tendon. He ſays, a Thread of ſtrong and thick waxed Silk is to be paſſed through the Eyes of two ſlender and common Needles, both which are to be paſſed inward through the upper Part of the Tendon, *Fig.* 4. E, and outward through the lower End of the Tendon F. but the two Needles are paſſed through on each Side the Edge of each Part of the Tendon. Then, removing the Needles, a Knot is made with the Thread upon a Compreſs of Leather, as we directed before. He prefers this Method to the preceding, as he thinks the Ends of the Tendon are hereby held more firmly together, without being apt to lacerate. When the Suture is finiſhed, he ſprinkles on *Pulv. ex Tereb. coct.* and dreſſes the Wound with *Linimentum Arcæi*, or common digeſtive, and ſecures the Parts from being diſplaced by Compreſs, Splints, and Bandage. Though there are ſome, who prefer the Suture with one Needle for Tendons in the Hand, as being leſs troubleſome to the Patient and Surgeon; yet I think this Method may be uſeful in the larger Tendons. When there are ſeveral Tendons divided, the Suture is to be made upon each of them ſeparately.

Treatment after the Suture.

VI. For the Dreſſings after the Suture, the Parts are to be firſt treated with Lint dipt in *Ol. Tereb. vel Balſ. Capiv.* over which is to be applied a Compreſs dipt and expreſſed out of warm Spirits of Wine; in the mean time the Palm of the Hand is to be expanded and ſupported upon a ſtiff Paſteboard, *Fig.* 5. with Compreſſes and Bandage; and, laſtly, the whole Arm is to be fomented with warm Spirit of Wine, or *Oxycrate*, and wrapped up in Linen Cloths dipped therein; and indeed ſome uſe *Ol. lumbricor.* not without Succeſs. And thus the Parts are to be retained till the divided Tendon appears to be united, which may be known by the Looſeneſs of the retaining Threads, which ought then to be cut, and cautiouſly extracted, and the Compreſs which ſuſtained the Knot, is to be likewiſe carefully removed; the Hand being afterwards ſuſtained on the Paſteboard till the Wound is healed, with vulnerary Balſams and ſcraped Lint, as in others. M. GARENGEOT deſcribes[a] a particular Machine for retaining the Hand and Arm in a convenient Poſture, with the Fingers extended, and a little reflected; but as this Intention may be very well anſwered by the means before deſcribed, I ſhall not inſiſt on the Inſtrument, though it may be well enough adapted to the Deſign of its Author. If any Stiffneſs or Rigidity impede the motion of the Part afterwards, it will be highly uſeful to rub in *Ol. Hyperic. vel Lumbric.* &c. every Day till it be removed. Laſtly, it is not a little ſurprizing, that many[b], even of our modern, and otherwiſe expert *Italian* Surgeons, ſhould with the Ancients, reckon this Operation fabulous and impracti-

[a] In his *French* Treatiſe on *Chirurgical* Inſtruments, Tom. II. pag. 290.

[b] As ARCÆUS Lib. II. Cap. — MARCHETTI, *Chirurg.* Obſ. 63. GENGA, in *Comment. ad Aphor.* HIPPOCRAT. PECCETUS in *Chirurg.* Lib. II. Cap. 47.

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cable, when there are Inſtances of its Succeſs given us by Authors of the moſt undoubted Credit and Veracity; they who deſire more, may conſult a profeſſed Diſſertation on the Subject by KISNERUS; as alſo GOELICKIUS Diſſ. *de Tendinum Affectibus.*

CHAP. CLXXIII.

Of Diſorders belonging to the lower Extremities.

WE have before delivered the Method of Amputating, Bleeding, and treating other Diſorders in the Leg and Foot; it now remains for us to conſider the Nature and Treatment of what other Diſorders are yet peculiar to thoſe Parts.

Of Sutures in the Tendons of the Leg, particularly the Tendo Achillis, *and* Extenſores Tibiæ.

I. Some of the Tendons in the Leg are alſo no leſs liable to be wounded than thoſe of the Hand, particularly the *Tendo Achillis*, and Tendon of the *Extenſores Tibiæ*. By the *Tendo Achillis* we mean, that vaſt large Tendon extended from the Calf of the Leg down to the Heel, and ſo called from the *Grecian* Heroe ACHILLES, who is ſaid to have been killed by a Wound thereof. When this Tendon is divided, the Patient cannot move or extend his Foot, to thruſt forward his Body, and, if it be not again united, he muſt continually halt, or go lame. I know GARENGEOT [a] indeed writes, that a certain Surgeon of *Paris* made a Cure of a Patient, who had a Fracture of the *Os Calcis*, by removing the Fragment of the Bone, and dividing this Tendon, the Patient afterwards being well without making any Suture, or any Defect remaining in the Limb: But I know not what to make of his Account; for I can ſee no Reaſon why a Surgeon ſhould divide this Tendon in a compound Fracture of the *Os calcis*; and the Relation ſeems to leave us in ſuſpence, whether or no he approves of a Suture in this Tendon. I could indeed wiſh, that this Author, who is, in many other Caſes, minute enough, had condeſcended to have given us a more exact Account of this wonderful Cure; and that he, as well as ſome other Writers, would expreſs themſelves a little more intelligibly. BORELLI [b] obſerves an Amputation of a mortified Part in the great Tendon (I ſuppoſe the *Achillis*) and that, after the Wound was healed, the Patient could walk without any Impediment, the Tendon being renewed, or filled again with a ſimilar Subſtance. The *Tendo Achillis* may be wounded in various manners, and attended with various Symptoms; when it is punctured, perforated, or but partially divided, the Patient is then afflicted with moſt grievous Symptoms, excruciating Pains, Convulſions, Fever, Gangrene, and perhaps Death itſelf; for the Symptoms muſt be worſe here than in Punctures of other Tendons, as this is much larger; from whence the Ancients ſeem to have taken their Notion, that Wounds of the *Tendo Achillis*

Tendo Achillis how wounded.

[a] *Operat. Chirurg.* Edit. 2. Tom. 3. pag. 267.
[b] *Obſervat.* Cent. II. Obſ. 2.

muſt be mortal, or at leaſt highly dangerous, as being the largeſt of any in the Body, eſpecially as they read or heard, that ACHILLES died of a Wound in this Part. The Symptoms attending a total Diviſion of a Tendon, are uſually much milder than thoſe of a punctured or half-divided Tendon; and therefore the Pain and Convulſions attending the laſt may be frequently removed in a ſhort ſpace, by cutting it quite in ſunder, when the Application of no Remedies will take effect. If therefore the *Tendo Achillis* ſhould be imperfectly divided, and malignant Symptoms ſupervene, they will diſappear upon cutting it quite through; but then it muſt be joined again afterwards by Suture, which will not excite any of theſe malignant Symptoms. But why the Puncturation of a Tendon by a Needle, in making the Suture, ſhould not be followed with the like bad Symptoms, as other Punctures inflicted by Accident, I muſt, with the generality, confeſs myſelf ignorant, though we are certain of the Fact from Experience; for want of which thoſe, who judged by Analogy, deemed this to be ſo dangerous and unſucceſsful an Operation, that they durſt not attempt it; even PAREY[a] himſelf, who was otherwiſe a bold Operator, declined this Suture on the ſame Account; and even the expert Anatomiſt VESLINGIUS[b] was aſtoniſhed to ſee the *Tendo Achillis*, and that of the *Extenſores Tibiæ* conjoined by Suture, which he eſteemed a raſh Undertaking, till he was convinced of the contrary by Experience. But that a wounded *Tendo Achillis* may be alſo conjoined, like many other Tendons, without making a Suture, may be concluded from Analogy, and the forecited Caſes of GARENGEOT and BORELLI; provided the Foot be bound up in an extended Poſture, ſo as to make the divided Ends of the Tendon meet each other.

Suture of the Tendo Achillis.

II. If the Surgeon ſhall judge a Suture of the Tendon to be neceſſary, the Performance of it may be with little or no Variation from the Suture of the Tendons in the Hands, before deſcribed in Chap. CLXXII. preceding, except that the Needle (whether ſtraight, *Fig.* 8. A. crooked or flat, *Fig.* 6 and 9.) and Thread are to be here proportionably larger and ſtronger than for the ſmaller Tendons, and then the Operation itſelf may be conducted in the ſame manner as we have directed in the Chapter preceding. The firſt Account of this Operation performed on the *Tendo Achillis*, and *Extenſores Tibiæ*, that I can meet with, is given by VESLINGIUS, the laſt of which he ſaw performed in *Africa*. But after him we have Accounts of the Operation being ſucceſsfully performed, not only by Mr. COWPER of *London* in *England*, after the manner of NUCK, ſee *Tab.* XXXVI, *Fig.* 10, CD, with two Needles; but alſo by M. THIBAUT and COSTIUS of *Paris*, according to the Relation of M. GARENGEOT[c]. As the Accounts we have of this Operation are ſo few and imperfect, it being totally omitted in many of our modern Syſtems; I ſhall therefore here inſiſt upon it the more largely, and deſcribe the remarkable Caſe given us by Mr. COWPER, as being the fulleſt and moſt exact I can meet with; but as even in this there are ſeveral Defects and Obſcurities, I ſhall endeavour to ſupply and illuſtrate them.

[a] See Lib. 9. Cap. 36.
[b] Epiſt. & Obſervat. XV.
[c] In *Operat. Chirurg.* Edit. prim. Tom. II. pag. 221. But in deſcribing the ſame in his ſecond Edition he has omitted the Name of THIBAUT.

III. Mr.

III. Mr. COWPER's Caſe is of a Man thirty Years old, who had a total Diviſion of the left *Tendo Achillis*, about three Finger's Breadth above the *Os Calcis*, the ſuperior Part of the Tendon being drawn up, at leaſt two Inches from the inferior, as in *Fig.* 10. AB. The neceſſary Apparatus being ready for the Operation, Mr. COWPER firſt divides the Integuments *a*, *b*, which inveſt each end of the Tendon AB, that he may have free Acceſs to the latter, and cloſe the former again by Suture [a]. This done, he then takes the firſt Needle C, (which, like the other marked D, is ſtraight and [b] ſlender) armed with a piece of waxed Silk, and paſſes them through the upper Part of the Tendon A, about half an Inch above where it was divided [c], guiding the Needle from without towards the inner Side of the Tendon [d]. He then paſſes the other Needle and Thread D of the ſame kind, and in the ſame manner through the upper end of the Tendon, but a little lower than the firſt; after this he paſſes both the ſame Needles through the lower end of the Tendon B, and, the Foot being extended, the two Ends of the Tendon were made to meet each other, by drawing the Threads, which were afterwards tied in ſuch a manner, as to retain the ends cloſe, whilſt the Foot continued in this poſture. The four ends of the Threads were next cut off [e], and the Wound dreſſed with Lint dipped in *Balſ. Tereb.* retained with Compreſs and Bandage. And, laſtly, to ſuſtain the Patient's Foot in ſuch an extended Poſture as to keep the Ends of the Tendon together, he contrived a ſort of Arch of ſtiff Paſteboard; which, being applied to the anterior Part of the Leg and Foot, held the latter extended and inflexible, preventing a Rupture of the Threads or Suture. He obſerves, that the Patient complained of great Pain in paſſing the Needles through the upper end of the Tendon; but felt no Pain in paſſing them through the lower end. After taking fourteen Ounces of Blood from the Patients Arm, he left him on his Bed, and ordered an Ounce of *Syr. de Mecon.* to compoſe him in the Evening. The next Morning the Patient told him, he had got ſome Sleep in the Night, and complained of nothing but that he was often awakened with Twitchings in the Calf of the wounded Leg. The third Day after the Operation he was dreſſed the ſame as at firſt, only with the Addition of a Fomentation, made of a Decoction of Wormwood, Sage, Roſemary, Bay-leaves, *&c.* On the fourth Day

A Caſe of Mr. COWPER's.

[a] Some of the moderns, and particularly GARENGEOT, diſapprove of this Inciſion, as being apt to induce many Inconveniencies; but it is apparent from the preſent Caſe, that nothing dangerous is to be feared from it; and if the end of the Tendon is drawn up ſo high as we are here informed, the Suture cannot be well performed without ſuch an Inciſion.

[b] GARENGEOT prefers crooked and large Needles for this Suture; but it appears from this Caſe, that ſuch as are ſtraight and ſlender will do; though crooked ones may be more handy.

[c] There is here no mention made of the *Acutenaculum*, which GARENGEOT thinks ſo neceſſary for this Suture; and therefore 'tis probable Mr. COWPER did not uſe any; yet the Operation ſucceeded.

[d] Mr. COWPER does not indeed relate this in Words: But 'tis apparent from the Figure; though even the Figure does not ſhew what Part of each End of the Tendon was perforated by the Needle C, *i. e.* neither where it entered, nor where it came out.

[e] In what manner Mr. COWPER tied theſe ends of the Threads, whether C with D, or C with C, and D with D, we are not told, either in Words, or by the Figure; but it ſeems to me to have been C with C, and D with D; otherwiſe he could not have extracted them ſeparately one after the other, as he preſently relates. Mr. COWPER alſo differs from other Surgeons in this Operation, chiefly in making his Knots, or tying the Ends of the Threads, without any Compreſs of Leather, Cork, Linen, *&c.* He alſo tells us when and how to extract the Threads after the Operation; which is a Circumſtance neglected by others.

the Dreſſing on the Wound appeared very wet with Synovia, or Gleeting from the Tendon. On the ſixth Day the Matter became thicker, and ſtill thicker on the eighth, the Gleet gradually diminiſhing. About this Time the two ends of the Tendon were not a little dilated, and a white Slough appeared on it towards the upper Part of the Wound; to which was applied *Tinct. Myrrhæ*, inſtead of *Balſ. Tereb.* Some time after, the Slough caſt off, and the two ends of the Tendon appeared overſpread with a fungous Fleſh. He then dreſſed the Wound with drier Applications than before, uſing ſometimes Lint only, and ſometimes *Pulv. Terebinth. coct.* On the tenth Day one of the Threads in the Suture appeared looſe, which he therefore divided and extracted; and, in two or three Days after, the other Thread appeared flaccid, which he therefore removed in like manner, retaining the Foot all that time well extended by the Paſte-board Arch [a]. He was often obliged to apply mild Eſcharotics, to diminiſh the Fungus on the Tendon, and, in leſs than thirty Days, he began to walk about, though as yet but lamely; however, this was much abated towards the end of the ſecond Month, and he afterwards gradually recovered all the Motions of his Foot, and ſhewed little or no Lameneſs in walking. AMB. PAREY, on the other Hand, gives us an Account of this Tendon divided by a Sword, and healed with much Difficulty without a Suture; but after the whole was cicatrized, when the Patient was riſing out of Bed, it broke open again; ſee Book 10. Chap. 36. of his *Surgery*.

Other Methods.

IV. VESLINGIUS gives but a very imperfect Deſcription of the Suture, which he ſaw made in the *Tendo Achillis* and *Extenſores Tibiæ*; ſaying only, that "I "ſaw that Tendon, which is formed by the *Gaſtronemii* and *Solei Muſcles*, unit-"ed by ſome Sutures made by certain Surgeons, after it had been cut aſunder "a little above the *Os calcis*, in a Writer belonging to my Father; and, in "like manner, I ſaw the Tendon of the *Extenſores Tibiæ*, which had been divid-"ed tranſverſly by a Scymeter under the *Patella* at the Knee, in an *Arabian*, "drawn afterwards together, and united with a Suture by a Surgeon of *Tu-*"*nis*." From which Relation we learn, that ſeveral, or more than one Suture was uſed; but this is a very ſuperficial Account; VESLINGIUS takes no Notice how they dreſſed and treated the Wound. We have another Method of making the Suture on a divided *Tendo Achillis*, deſcribed by my late Friend KISNERUS, formerly Phyſician at *Francfort on the Main*, which we have here inſerted from his Treatiſe, *de Tendinum Læſionibus*, and repreſented in our *Tab.* XXXVI. *Fig.* 7. By which the whole Buſineſs is ſo clearly exhibited to any one that has read the foregoing Chapter, that, in my Opinion, it needs no other Explication. But we may obſerve, that the lower end of the Tendon DE, is here perforated with the Needle firſt, contrary to the Method propoſed by the generality of Writers, who direct to enter the Needle through the upper end of the divided Tendon before the lower; and then to make a ſlip-knot with the Thread upon a Compreſs of Leather or Linen, on the lower end of the Tendon, which is here made the upper; and though it cannot be denied, but that the Operation may be well enough performed, in the Method here propoſed by

[a] It is obſervable, that this Paſteboard is not mentioned by other Writers, though abſolutely neceſſary, to extend the Foot in and after this Operation; nor do I find any Notice taken by others, concerning the Application of Eſcharotics to take down a Fungus of the Tendon.

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KISNERUS; yet I muſt think, agreeable to the Practice of Mr. COWPER, that it may be more commodiouſly performed, by beginning with the upper end of the Tendon firſt.

V. For making the Suture upon the divided Tendon of the extenſor Muſcles of the *Tibia*, which is a Caſe barely mentioned by VESLINGIUS, I cannot meet with any particular Directions given by any Author whatever; but I conceive it may be performed much after the ſame manner with the preceding; only as this Tendon is broader than the *Tendo Achillis*, it cannot well be conjoined in all its Parts, without making a double Puncturation thereof with the Needle and Thread, after the manner of NUCK, *Tab.* XXXVI. *Fig.* 4. *lit.* E and F. The Wound may be afterwards treated as in the Caſe of Mr. COWPER, Sect. III. or according to the Directions we have given for Sutures on the Tendons of the Hand. But, in the mean time, the Ham muſt be exactly extended, ſo as not to have the leaſt Motion, by means of Splints of Wood, or ſtiff Paſteboard and Bandage, as in a Fracture of the *Patella*, keeping the whole Limb at reſt. Though I make no doubt, that, if the two ends of the Tendon were thus retained together, and the Leg kept extended in this poſture, the Tendon would unite, and the Wound heal, without making any Suture; and the ſooner, becauſe the Tendon being connected to the *Patella*, will not fly back, or recede ſo much when divided as the *Tendo Achillis*; and therefore the ends of the former may be more cloſely and commodiouſly approximated, and retained together by Bandage, than thoſe of the latter.

Suture of the Tendo Extenſorum Tibiæ.

VI. By way of Appendix to this Chapter, I ſhall conclude with obſerving, that it is my Opinion divided Ligaments may be almoſt as eaſily conjoined by Suture, as Tendons; and ſince their Subſtance or Texture are pretty much alike, divided Ligaments may be ſewed and treated in the ſame manner as Tendons, and that not without Succeſs, in the Opinion of myſelf and others[a]. But in Sutures of the Ligaments it may be beſt to uſe two Needles, armed with one Thread, as in *Gaſtroraphia*; which kind of Suture is alſo preferred by GARENGEOT[c] for Tendons; ſo that each end of the divided Tendon, or Ligament, is to be perforated by paſſing the Needles from their internal Margin; and, after drawing the ends of the Thread ſufficiently tight, to faſten them by knots, conducting the reſt of the Treatment as before in the Tendons.

Of Sutures on the Ligaments.

CHAP. CLXXIV.

Of Varices.

I. THE Name *Varices* is by Surgeons given to thoſe unequal or knotty and livid Protuberances of the Veins, which are formed in all parts of the Body, but moſt frequently in the Legs, near the Ancles, and often higher near the Knees, or in the Thighs, Scrotum, Abdomen, and ſometimes the Head, as

Varices deſcribed.

[a] As KISNERUS Diſſert. *de Tendinum Læſionibus*, Sect. 30. VALENTINI in *Chirurg.* pag. 821. AQUAPENDENS, *&c.*

[b] *Operat. Chirurg.* Tom. III. Edit. 2. pag. 278.

CELSUS

Celsus[b] obſerves. Women with Child are the moſt liable to this Diſorder, but it alſo frequently happens to plethoric Men, who are hypochondriacal, have an inſpiſſated or viſcid Blood, and an Obſtruction, or a Scirrhoſity of their Liver. The larger theſe Protuberances of the Veins grow, the more painful and troubleſome they prove, by the greater Diſtraction of Coats or Membranes of the Veſſel, which are ſometimes quite ruptured, and occaſion a profuſe Hæmorrhage, or an Ulcer, as I have ſeveral times experienced. Theſe which are ſmall, giving the Patient no Pain or Uneaſineſs, are uſually neglected by him, and do not require any Aſſiſtance from the Surgeon.

Method of Cure.

II. To prevent the Diſorder from running to any great length, when it is once on foot, it may be proper to bleed the Patient, preſcribe a proper Regimen and Diet, and to apply an expulſive Bandage cloſe to the diſordered Legs, (as at *Tab.* III. *Fig.* 1. F.) and as the Bandage ſlackens to draw it tighter by degrees, and not to leave it off till the Diſorder is without Danger. We learn from Celsus, that the Practice of the Ancients was either to cauterize, or extirpate them with the Knife: but our Procedure at this time of day is much milder. In large Varices, we endeavour to contract and ſtrengthen the dilated Coats of the Veins, by the Application of the ſaid expulſive Bandage with Fomentations of red Wine, and aſtringent Medicines, eſpecially Vinegar and Allom, and by binding a thin Plate of Lead on the diſtended Veſſel. Dionis here recommends a ſort of leathern Stockings, which, being tightened at diſcretion by the lace, are to be wore Day and Night; ſee them repreſented in *Tab.* XXXVI. *Fig.* 11. Though the ſame Stockings may be alſo conveniently made of ſtrong brown Linen in the ſame Form, as I have ſeen. Dr. Harris thinks *Tinct. Myrrhæ* a very potent Remedy for Varices, if it be often applied with a Feather, and the Part covered with *Emplaſt. Diaſulph. Rulandi*, which will ſtill ſucceed better with Bandage, or the ſtrait Stocking.

Cure by the Knife.

III. But when the Varices are enlarged to an enormous Size, ſo as to give the Patient great Uneaſineſs, and threaten a profuſe Hæmorrhage, with other bad Symptoms; it will then be neceſſary to lay the worſt of them open by a longitudinal Inciſion with the Scalpel, or a Lancet, and, taking away about eight or ten Ounces of the grumous and viſcid Blood, more or leſs in proportion to the Patient's Strength and Habit, the Wound is then to be dreſſed with *Bol. Armen. & Acet.* applied on ſcraped Lint, to be retained with a Plate of Lead, Compreſs, and Bandage. And thus the Vein unites again, as in Bleeding, and forms a Cicatrix ſtrong enough to reſiſt any farther Dilatation, and capable of preventing the like Diſorder, at leaſt in that Part of the Veſſel. The Ancients cured Varices either by Inciſion or Cauterization, as Celsus obſerves, (*Lib.* VII. Cap. 36.) In the firſt Method they divided the Skin upon the Tumour, and, elevating the diſtended Vein with a Hook, they freed it by a Scalpel from the adjacent Parts, and then cut it out, healing up the Wound with a Plaſter. Goueius tells us, that the moſt ſafe and ready Method of curing Varices is, by paſſing a crooked Needle with a double waxed Thread under the lower Part, or ſmall End of the diſtended Vein, and then to make a ſtrong ligature on the Veſſel with the Thread; after which the Varix is to be laid

[b] Lib. VII. Cap. 31. & Lib. V. Cap. 26. circa initium, ubi ait: *Cum vena intumeſcit, in Varicem convertitur.*

open

open with a Lancet, the grumous Blood removed, and the Wound well dreſſed with ſome digeſtive Ointment, with which it is to be treated till it is near healed up. The Method of curing Varices by Cauterization, uſed by the Ancients, is thus deſcribed by CELSUS *(loc. cit.)* They firſt divided the Integuments, and, having denudated the Varix, or diſordered Part of the Vein, they then applied to it a ſmall and flat Cautery, or red-hot Iron, with which they avoided touching the lips of the Wound, by drawing them ſideways by Hooks; and, laſtly, the Dreſſings were made with the Medicines uſually applied for Burns. Dr. HARRIS thinks this Treatment of Varices, by Inciſion and Cauterization, to be raſh and cruel; but they are ſometimes ſo large and painful to the Patient, as not only to hazard his Life, by burſting in the Night, as I remember an Inſtance, but alſo to prove incurable by any other means than the Knife and Needle.

IV. In order to prevent the Return of Varices when they have been once cured, it is highly neceſſary for the Patient to avoid plentiful and groſs Feeding; rather preferring Drinks or Suppings, with Tea, Coffee, and light vegetable or animal Food, uſing frequent Exerciſe, with Frictions of the Legs, and bleeding at convenient Intervals, eſpecially Spring and Fall. The ſame Cautions are alſo neceſſary to be obſerved by thoſe, who are but juſt beginning to be afflicted with this Diſorder; if they are deſirous of preventing greater Evils, and of avoiding the Severities of the Knife or Cautery. MUYS tells us, that he opened a Varix combined with an Ulcer once every Year, and diſcharged a Pound of Blood; by which the Eruption of the Ulcer was prevented. See his Rational and Practical *Surgery*, Decad. I. Obſ. 6. Prevention.

CHAP. CLXXV.

The Method of cutting out the Nail of the Great-toe, when it turns into the Fleſh.

I. THE Great-toe Nail ſometimes turns too much in on one Side, ſo as to enter the Fleſh, and cauſe violent Pain and Inflammation to ſuch a degree, that the Patient cannot walk. The moſt general Cauſe of this Diſorder is the wearing of too ſtrait or narrow-toed Shoes; which they will do well to avoid, who are deſirous of being free from the Complaint. But, in order to ſet the Nail at liberty from the tender Fleſh, into which it has fixed itſelf, the Patient's Foot is firſt to be held half an Hour in hot Water, to mollify the indurated Nail and Skin, and that the Water may penetrate the farther, it may be proper to ſcrape off the outer Surface every two or three Minutes with a Pen-knife, or a Piece of Glaſs, after which the inflected Nail is to be gently elevated with the Finger, or a Probe, and Piece of ſoft dry Lint interpoſed betwixt it and the Fleſh, and ſo bound up with a Compreſs dipt in warm Spirit of Wine, which Operation is to be repeated again the next Day, till the Pain and Inflammation diſappear. Nature and Cure of the Diſorder.

II. If the Method before preſcribed prove inſufficient to remove the Diſorder, we muſt then have recourſe to the Knife; in order to which, the Foot, being Cure by the Knife.

being macerated in warm Water, as before, is then to be placed and held in a convenient Poſture upon a Chair by the Hands of an Aſſiſtant, and the Operator muſt inſinuate the ſtrong Nail-ſciſſors, *Tab.* XXXVI. *Fig.* 12 and 13, gradually under the injurious Part of the Nail, to cut it off, and then extract it, if it does not come away of itſelf with a pair of Pliers; and though the Operation itſelf may give the Patient no ſmall Pain for a ſhort Time, yet he will quickly perceive the Advantage by a more laſting Eaſe. The Part is next to be dreſſed with ſcraped Lint, or Linen Compreſſes, dipt in *Oxycrate*, or warm Spirit of Wine, with *Aqu. Cal.* and, in urgent Caſes, it may be fomented two or three times in a Day, till the Pain and Inflammation are removed. In the mean time the Patient muſt not walk upon his Foot, till there is no Danger of the Pain and Inflammation returning. If any luxurious Fleſh grow up in the Cure, it may be taken down with *Alumen uſtum*, and, to prevent the Diſorder from returning again for the future, the wearing of eaſy Shoes, with waſhing the Feet, and paring the Nails once a Month, are, by Experience, as well as the Word of M. Dionis, confirmed to be the ſtrongeſt Preſervatives; but it muſt be obſerved, that the Nail of the Great-toe ought to be ſcraped very thin, either with a ſharp Knife, or a Piece of Glaſs, that it may not have Reſiſtance enough to run into the Fleſh again by the Preſſure of the Shoe.

CHAP. CLXXVI.

Of treating Corns *in the Feet.*

Corns deſcribed, with their Cauſes.

I. IT is not unfrequent for People to be troubled with hard Tubercles, like flat Warts, in ſeveral Parts of their Feet, eſpecially upon the Joints of their Toes, which are generally termed *Corns*, from their cornuous or horny Subſtance, and by the *Latins*, *Clavia* [c], from their Figure, penetrating down into the Fleſh like a Nail, or Spike. This Diſorder, as well as the preceding, is not unjuſtly attributed to the wearing of too ſtrait, or narrow-toed Shoes, which never fail to produce theſe Tubercles, with their unwelcome Torments, eſpecially if the Perſon is obliged to ſtand or walk much, and in the Summer Time.

Cure.

II. Various are the Methods uſed for removing theſe Calloſities of the Skin and Cuticle, ſome by the Knife, and others by the Application of emollient and cauſtic, or eroding Medicines; but, which ever way they are removed, it is certainly much the beſt, to let their hard Subſtance be firſt ſufficiently mollified: And this may be obtained by frequently macerating them for a conſiderable Time in warm Water, and afterwards paring off their uppermoſt and hardeſt Surface with a Penknife, which will often make them quite eaſy for a time; But if this does not ſuffice, you may apply a Plaſter of green Wax, *Gum Ammoniac. de Sapon*, &c. or a Leaf of Houſe-leek, to be renewed every Day. After theſe Applications have been continued for ſome time, you may then venture to peel them away with your Finger-nails, or cut and ſcrape them with

[c] See Celsus Lib. V. Cap. 28. N. 14.

a Scal-

a Scalpel; but with great Caution, to avoid injuring any of the ſubjacent Tendons of the Extenſor-muſcle, which might occaſion violent Pains, Inflammations, Convulſions, a Gangrene, and even Death; all which have alſo been frequently the Conſequences of Cauſtics penetrating to theſe Parts, ſuch as *Ol. Vitriol*, *Aqu. Fort. Arſenic*, &c. as HILDANUS obſerves, *Cent.* VI. Obſ. 100. It muſt be confeſſed, that the Treatment of Corns by thus ſoaking and paring them, with the Application of Emollients, does not very often totally remove them, but that they will grow up again in a ſhort time; however, the Patient is ſure to be ſafe in this Practice, which ſeldom fails, either totally to extirpate them in proceſs of time, or at leaſt to make them eaſy and tolerable to the Patient, provided he wears eaſy Shoes, and repeats the Operation once a Month, or as often as they give him any Uneaſineſs. But if the Patient will take the Pains to waſh his Feet, and ſoak the Corns well every Evening in warm Water and Bran, then to ſcrape off the ſoft Surface, and apply a freſh Plaſter, he will go near to be quite rid of them in Time, provided he does not renew them by wearing ſtrait Shoes.

CHAP. CLXXVII.

Concerning the Treatment of Infants that are Bandy-legged, *with their Feet turning inward or outward.*

MANY Children have their Feet diſtorted, or turned on one Side, either from ſome Defect in the Birth, or from the Imprudence of the Nurſe, endeavouring to make the Child ſtand and walk, before its Legs are ſtrong enough to ſupport the reſt of its Body. In ſome the Legs themſelves are crooked, and in others the Knees are diſtorted: Thoſe who have their Feet diſtorted inward, at the Articulation of the *Tarſus* with the *Tibia*, are denominated *Vari*; as thoſe who have them diſtorted outward, are termed *Valgi*. The Nature and Treatment of this Diſorder differs according to the particular Parts affected. The beſt Method of preventing it, will be by keeping weak-limbed and rickety Children from a too early and frequent Uſe of their Legs in ſtanding or walking; on the contrary, let them always ſit or lie down, and be carried either in the Arms, or ſome Vehicle, till the Bones are become ſtrong and firm by Age. But if even then the Diſorder is alſo advanced, and become formidable, it will be neceſſary, after the Uſe of Emollients, to apply a kind of Boots or Inſtruments deſcribed and recommended by HILDANUS and PAREY; (ſee *Tab.* XXXVI. *Fig.* 14 and 15.) which being compoſed of ſtrong Leather, with thin Plates of Iron or Wood, proportioned to the Size of the Limb, its crookedneſs may be gradually removed as it grows up, by conſtantly wearing the Machine Day and Night. But as theſe Boots are often very uneaſy and cumberſome, when badly contrived and made by the Artificer, Surgeons have therefore invented ſome Inſtruments more properly adapted to the Caſe, as in *Tab.* XXXVI. *Fig.* 16. where the Parts A A are made of Hide-leather, ſtrong Paſteboard, or thin Plates of Iron or Braſs, joined together by the flexible Leather B B, that they may be fixed upon each Side of the Leg, as in *Fig.* 17. being

tied on by the Ligatures CC, and conſtantly wore Day and Night. Thus by the frequent Uſe of Emollients, and theſe two Inſtruments of HILDANUS, *Fig.* 16 and 17. the Incurvation of the Foot and Ancle may, by degrees, be remedied; but if the Deformity is not great, I think it better to leave the whole to Nature, than to moleſt the Parts with Machines, which injure them, and ſtint their Growth; whereas the Parts would improve naturally of themſelves, as they grow up, better without their Aſſiſtance, as I have often obſerved, provided the Children do not ſtand or walk much, but are carried or wheeled about. For more on this Head, conſult HILDANUS *Cent.* VI. Obſ. 89 and 90. SOLINGEN *Tab.* XII. LE CLERC, *&c.*

An EXPLANATION *of the* THIRTY-SIXTH PLATE.

Fig. 1. Repreſents MEEKREN's Method of removing *Ganglia*, by beating with the Fiſt on the Tumour A.

Fig. 2. AA Shews a ſmall ſtraight Needle with a flat Point, for the Suture of Tendons in the Hand, BB a ſtrong but ſlender waxed Thread with a large knot C at the End, intercepted by a ſquare bit of Leather D, through which the Needle and Thread are paſſed up to the Knot.

Fig. 3. Exhibits two ſquare Bits of Leather perforated in the middle for making the Suture of the *Tendo Achillis*, as they are repreſented in *Fig.* 7. E. F.

Fig. 4. Gives the Method of making the Suture for a Diviſion of the Tendons belonging to the Extenſors of the Fingers on the Back of the Hand: *aaaa* the tranſverſe Diviſions of the Tendons, A the manner in which the double Knot of the Thread is fixed on a Square Bit of Leather upon the upper end of the divided Tendon. B ſhews the manner in which the double Thread is tied with a ſlip knot over a round Compreſs, without a bit of Leather, in the lower end of the Tendon. C ſhews the knot of the double Thread intercepted upon the end of the Tendon by a round Compreſs inſteadof a ſquare piece of Leather, the other ends of the Thread D, being faſten'd with a ſlip-knot on a like Compreſs as before. E denotes the method of Suture uſed by NUCK, in which the upper end of the Tendon is perforated in two diſtinct Places *bb*, with two ſmall Needles and one Thread, the loop-end of the Thread being intercepted by a bit of Leather, or round Compreſs E, after which the other end of the Tendon is alſo perforated on its in-ſide in two Places by the ſame Needles, and the ends of the Thread tied upon a Compreſs or Bit of Leather.

Fig. 5. Exhibits the Shape of a Ferula to be made of thin Wood or ſtiff Paſteboard, to extend the Fingers in a Suture of the Tendons on the Back of the Hand.

Fig. 6. Repreſents GARENGEOT's ſmall crooked Needle for the Suture of Tendons, which the Moderns think more handy than the ſtraight one, as it may be better held, and tranſmitted through the Tendon; but it has no ſharp or cutting Edges at its Point like the common crooked Needles in *Tab.* I. leſt it ſhould wound the tranſverſe Fibres of the Tendon. Its Author thinks there might be a ſharp-Edge in its concave Part A; but I rather think it ſhould be on the Convexity B. The Eye of this Needle is not made ſideways, as is common, but anſwering to its Concavity and Convexity, for the more eaſy Tranſmiſſion of the Thread. This ſmall Needle is for the leſſer Ten-

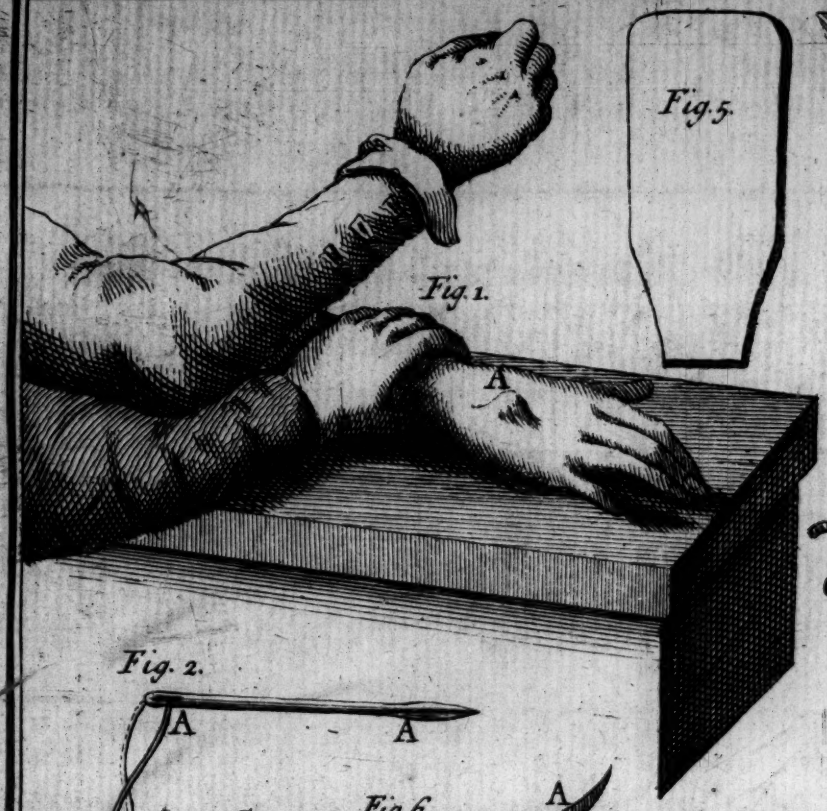


Fig. 1.
A

Fig. 5.

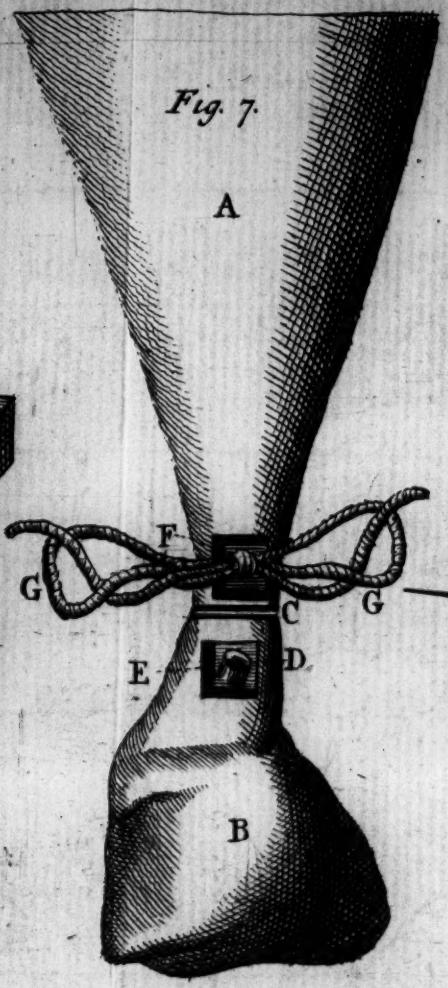


Fig. 7.
A
F
G
C
G
E
D
B

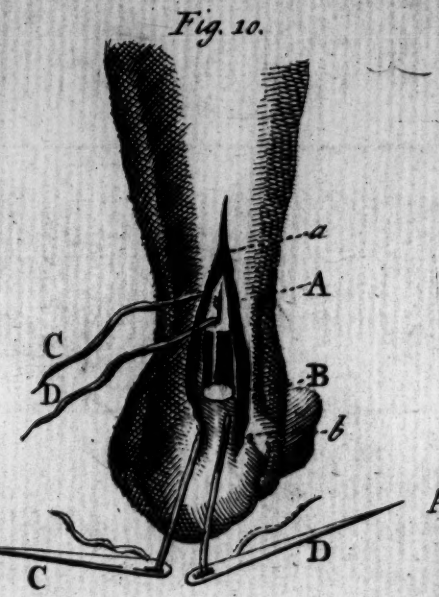


Fig. 10.
a
A
C
B
D
b
C
D
A

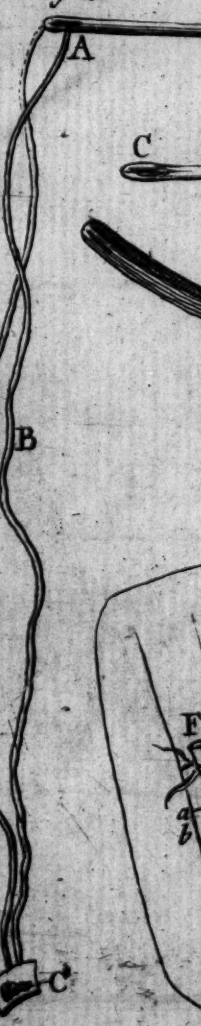


Fig. 2.
A
A
B
D
C

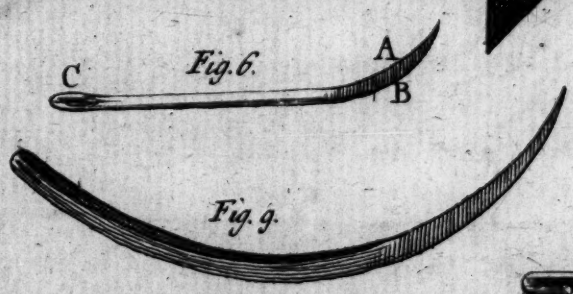
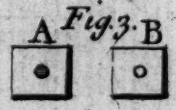


Fig. 6.
A
C
B
Fig. 9.


A
Fig. 3.
B

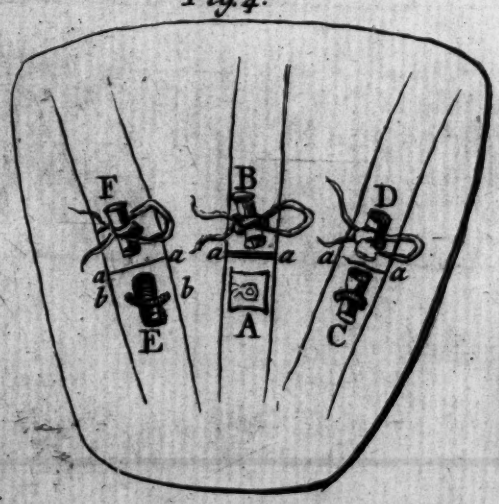


Fig. 4.
F
B
D
a
a
a
a
a
a
b
b
E
A
C

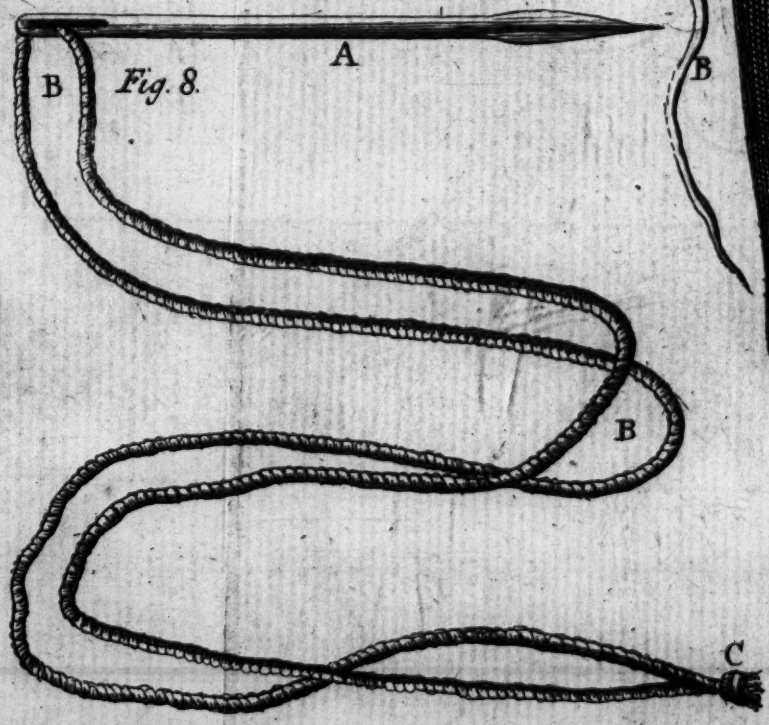

A
B
Fig. 8.
B
C

Fig. 11.
A
B
B

Fig. 17.

Fig. 16.

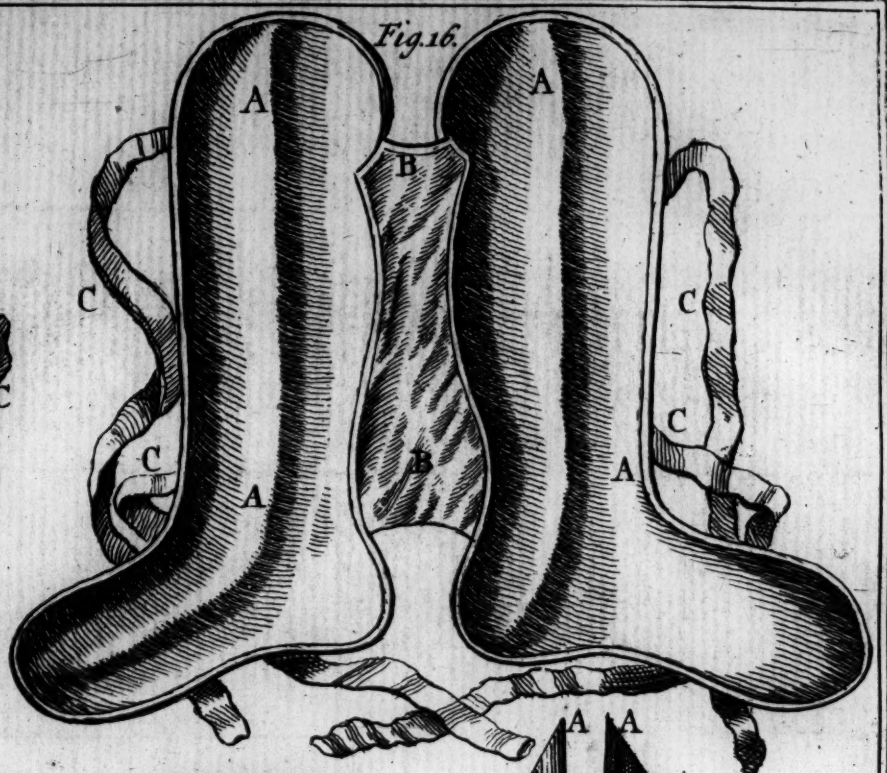


Fig. 12.

Fig. 15.

Fig. 14.

Fig. 13.

J. Mynde sc.

Tendons, as thoſe in the Hands; but for the larger, as the *Tendo Achillis*, the Needle muſt be proportionably bigger, as at *Fig.* 9.

Fig. 7. Shews the Method of uniting the *Tendo Achillis* by Suture, as taken from KISNERI *Diſſertatio de Tendinum læſionibus.* A The bottom of the calf of the Leg, B the *Os Calcis* into which this Tendon is inſerted or fixed, C the Wound or Diviſion of the Tendon, D the knot of a ſtrong double Thread, intercepted by the ſquare bit of Leather E, F the ſame Thread faſtened by the ſlip-knot G G, upon another ſquare piece of Leather. But the generality of Surgeons chuſe to perforate the upper Part of the Tendon firſt, and to make the knots upon its lower End.

Fig. 8. Exhibits a large, ſtrong, and ſtraight Needle with a flat Point, recommended by ſome for the Suture of the *Tendo Achillis*, and Tendon of the *Extenſores Tibiæ*, BB the double-waxed Thread armed with the knot C at its Extremity.

Fig. 9. Is a large crooked Needle ſhaped like that at *Fig.* 6, for the Suture of the *Tendo Achillis.*

Fig. 10. Shews Mr. COWPER's Method of making the Suture on the *Tendo Achillis*, agreeable to the Caſe which we before inſerted from him, in the *Philoſophical Tranſactions*, N° 252. AB the two Ends of the divided Tendon, perforated by the two ſtraight Needles C, D, armed with two Threads, by tying which the divided Ends A B, were conjoined; *a b* denote two Inciſions in the Integuments, to give free Acceſs to the Tendon.

Fig. 11. Is a kind of Stocking made of Leather, or coarſe Linen, to be faſtened tight about the naked Legs by the Lace B, to be conſtantly wore for Varices and oedematous Swellings of the Legs.

Fig. 12. Repreſents a Pair of ſtrong Sciſſars for extirpating Part of the Great-toe Nail, when it runs into the Fleſh; it has one obtuſe Point A, to reſt eaſy upon the Fleſh. BB its two Handles, which are thrown open by the Spring C.

Fig 13. Is a Pair of Nail-ſciſſars, deſcribed and recommended by GARENGEOT in his *French* Syſtem of Inſtruments: The cutting Parts A A, are concave and ſharp-pointed, and its two Handles BB are flung open by the Spring C.

Fig 14 and 15. Exhibit the Boots of AMB. PAREY for Children, who are either *Vari*, having their Feet inflected inward, or *Valgi*, having their Feet incurvated outward.

Fig. 15. Shews the ſame ſhut by three ſmall Hooks, as the preceding repreſented it open.

Fig. 16. Is another Machine for the Bandy-legged, propoſed by HILDANUS, *Cent.* VI. Ob. 89 and 90. A A the two Sides made of Hide-leather, Iron-plate, or Braſs, according to the Age and Strength of the Child to which they muſt be made ſizeable, BB is a piece of ſoft and flexible Leather by which the two Sides are connected, C C the two Ligatures on each Side, by which the Machine is faſtened tight about the crooked Leg.

Fig. 17. Repreſents the preceding Inſtrument faſtened upon the Leg, which is explained by the ſame Letters; but only the inner Side of the Inſtrument can be here viewed.

INSTITUTIONS OF SURGERY.

PART the THIRD.

CHAP. I.

Of Bandages *in general.*

Uſe of Bandages.

I. THE great Uſe and Neceſſity of Bandages in relieving and curing the Diſorders of human Bodies, is very apparent, not only from their being thought worthy to be made an important Subject of Conſideration by the firſt Fathers of Phyſic, as HIPOCRATES[a] and GALEN[b], with other eminent Phyſicians; but alſo from there being hardly any one Operation in Surgery practicable without their Aſſiſtance. Even when an Operation has been performed, in all other reſpects, with the greateſt Judgment and Dexterity, yet if the Surgeon miſcarry in his Bandage, by an unſkilful Application thereof, all his other Endeavours, though juſt and laudable, may either totally, or in a great meaſure prove fruitleſs, to the great Damage of his Reputation: And this more eſpecially in the Treatment of Wounds, Fractures, Luxations, Amputations, and the like. We may add, that in Fractures and Luxations, after a Reduction of the Parts, the whole Cure depends intirely on the Bandage, and, in many profuſe Hæmorrhages, nothing can afford ſo certain and ſpeedy Relief, as an exact Deligation of the Wound with a fit Compreſs and Bandage, which may even ſave the Life of the Patient, as every one knows that has the leaſt Knowledge of the Nature and Treatment of Wounds. To ſay nothing of the Recommendation, that the Neatneſs and Readineſs of making a Bandage and Dreſſing will give the Surgeon, both as to his Patient, and the Spectators, who judge of his other Abilities by his Performance of what comes under the general Cognizance of every one's Senſes, as GALEN[b] juſtly obſerves. And

[a] Lib. *de Officina Medici.*
[b] Lib. *de Faſciis.*
[c] Lib. *de Faſciis*, where he directs: *Quod injicitur, celeriter, jucunde, prompte & eleganter injiciatur.*

there-

therefore we ſhall think our Time well improved in making a more ſtrict and ample Expoſition of what has been hinted in general upon this Subject in our Introduction, and in conſidering the particular Make and Application of every ſingle Bandage uſed in all the Operations of Surgery.

A Bandage deſcribed.

II. By a Bandage we intend a piece of ſtrong Linen-cloth, of a convenient Size and Shape, ſuitable for ſome particular Part of the Body, which it is to inveſt. Sometimes Bandages are ſquare, like an Handkerchief, or a Napkin, or of other Shapes, but generally they they are long and narrow, when deſigned for Wounds, Fractures, Luxations, or to retain the Dreſſings on moſt Parts of the Body. The *French* Surgeons make a Diſtinction betwixt a *Band* and a *Bandage*; by the firſt they intend the looſe Cloth before its Application, and, by the laſt, the Band as it is fixed upon the Body.

Kinds of Bandages.

III. The Kinds of Bandages are various: Some are common to ſeveral Parts of the Body, others are *proper* to one only; ſome again are *ſimple*, and others *compound*. The ſimple Bandages are thoſe without any Slits or other pieces joined to them. With regard to theſe, it is neceſſary to obſerve, that the Cloth of which they are formed, ſhould be cut according to the Courſe or Length of the Threads or Piece, and generally about two, three, four, or more Fingers Breadth, according to their particular Uſe, and the Size or Form of the Patient's Limb. Theſe ſimple Bandages are commonly rolled up at one or both Ends, for the more commodious Application of them to the Parts affected, and then they are denominated ſingle or double-headed Bandages or Rollers. The Figure of one with a ſingle Head may be ſeen in *Tab.* II. *Fig.* 6. and a double-headed one at *Fig. c.*

Kinds of Bandages made with the ſimple Roller.

IV. There are chiefly four ways of applying a ſimple Bandage or Roller, which are diſtinguiſhed by different Denominations. The firſt is the *circular* or annular Bandage, which is when the upper Rounds come exactly over the undermoſt. 2. The *Spiral*, when the Turns of the Roller either aſcend or deſcend upon each other in a ſpiral Form, like a Screw, termed by the *French*, *Doloires*. 3. The *Rampant*, which is, when the Turns of the Spiral aſcend or deſcend upon the Part at ſuch a Diſtance (more or leſs) as not to touch each other, leaving intermediate Spaces uncovered. 4. The *Reinverſed*, when the Declivity of the Limb, as the Leg, requires the Roller to be inverted, or half-twiſted at each Round, to make it ſet tight, ſmooth, and even.

Compound Bandages.

V. Compound Bandages are thoſe which have Slits, Apertures, or are made up of ſeveral Pieces (or ſimple Bandages) joined together by Suture; as that with four Heads, a Hole for intercepting the Chin, Noſe, *&c.* Some Figures of theſe Bandages may be ſeen in *Tab.* II. *Fig.* d, e, f. g, h, to which we may add, the Bandage with eighteen Heads, uſed in compound Fractures, repreſented in *Tab*, IX. *Fig.* 4. BB. Some of the compound Bandages are denominated from the particular Parts to which they are applied, whether in the Head, Thorax, or Abdomen. Some take their Names from ſeveral Things which they reſemble in Figure, as the *Scapha*, *Stella*, *Stapes*, *Spica*, &c. And others again are denominated from their particular Uſes, retentive, uniting, expulſive, *&c.* as may be ſeen more particularly in our following Diſcourſe.

Matter and Formation of Bandages.

VI. The Matter of which Bandages are generally compoſed at the preſent Day, is Linen-Cloth, the neceſſary Conditions of which are, firſt, that it ſhould be *clean*, partly for Neatneſs, and partly that it may not prove offenſive to the Wound;

Wound; for, as GALEN ſays, the Surgeon ought to aim at Neatneſs and Cleanlineſs, as well as Uſefulneſs in his Dreſſings. 2. That it ſhould be *ſoft*; for which Reaſon, that which has been wore ſome time is better than quite new; which laſt would, by its Aſperity, be apt to irritate, inflame, or make the Parts itch; yet it ought not to be wore thin, as that will make the Bandage ſubject to give way too much, or even to break. It ſhould be *ſtrong*, conſiſting of Threads, neither very coarſe, nor very fine, ſince the firſt will make the Bandage ſit uneaſy upon the Part, and the other will render it liable to break or ſtretch. 4. It ſhould have *no Hems*, *Knots*, *nor looſe Threads*, *nor any Seams* in it, that can be avoided; but if the great Length of the Bandage requires the laſt, they ſhould be as few and as even as poſſible, for the ſame Reaſon that it ſhould be free from Knots and Hems. 5. And, laſtly, the Length and Breadth, which every Bandage ought to have, cannot be aſcertained in the groſs, but muſt vary at the Diſcretion of the Surgeon, according to the Size or Age of the Patient, with the particular Part affected; however, that Beginners may have ſome looſe Idea in this Affair, we ſhall preſcribe a certain Length and Breadth to the ſeveral Bandages hereafter deſcribed.

Tenſion of the Bandage.

VII. It is a very neceſſary Circumſtance to be obſerved with regard to Bandages, that they be neither drawn too tight, nor left too looſe, but retain a moderate Tenſion. For too great Tenſion of them will occaſion violent Pains, Echimoſis, or a livid Tumour with Inflammation, a Gangrene, and even a Mortification of the Part; whereas, on the contrary, when they are too lax, they prove of little or no Service, eſpecially in Fractures, Hæmorrhages, *&c.* You may judge whether your Bandage be over-tight, partly by endeavouring to paſs your Finger under it, and partly from the Complaint of your Patient, and Appearance of the Part affected. If the Part does not at all ſwell, nor give the leaſt Uneaſineſs to the Patient, you may conclude your Bandage to be too ſlack; but if your Patient complains of violent Pain, and you obſerve a very tenſe and livid Tumefaction of the Parts below, and no Appearance of the Veins above, you will then have Reaſon to judge your Bandage too ſtrict, as it muſt be too lax when there is no Tumour and Reſiſtance at all, ſo that you may eaſily thruſt your Finger underneath. In the Application of a Bandage with one Head to any of the Limbs, it is neceſſary to faſten it on by two or three circular Rounds one upon the other, to prevent it from ſlipping or giving way; but if the Bandage or Roller be double-headed, you are then to apply the middle of it firſt, and then roul the two Ends of it tight about the Limb; but then the two Ends of it ſhould, for the greater Security, be twiſted together two or three times before they are pin'd. It muſt be obſerved, that all Bandages and Compreſſes for Fractures and Luxations, ought never to be applied dry, but always moiſtened in warm Wine or Vinegar; which will not only make the Bandage adhere more firmly, but alſo at the ſame time ſtrengthen the Part, and abate or prevent its Inflammation. Laſtly, if the Parts under the Bandage itch intolerably, after relaxing the Bandage a little, you may bath them with *Oxycrate*, or wet the Parts and Bandage with Vinegar without any Relaxation, when that may be dangerous.

Renewal of Bandages.

VIII. In removing the Bandage and Dreſſings, in order to renew them, you ſhould be very careful not to pull them off too haſtily or roughly, for the Bandage communicating with the Compreſſes and Pledgets, and theſe laſt with the Lips

Lips of the Wound and Fragments of the Bone, you might, by ſuch heedleſs Precipitation, induce a dangerous Hæmorrhage, and other bad Symptoms. And for the ſame Reaſon, when your Bandage is perceived to adhere faſt to the Skin, being glewed thereto by the Blood, or Matter dried, you ought always, in that Caſe, to moiſten it firſt with Wine, or its Spirit, and then to take it off very gradually. You ought alſo to take care that your freſh Bandage, and other Dreſſings, are all prepared in Readineſs to apply to the Parts, before you take off the old; otherwiſe the Wound might be injured by being long expoſed to the cold Air.

IX. Though we have briefly hinted at ſome of the general Uſes of Bandages in the firſt Section of this Chapter, yet it may not be here improper to conſider ſome of their other Uſes, which are more particular. And, firſt, they are often Medicines of themſelves, being the ſole Application for the Cure of the Diſorder; as in many Fractures, Luxations, Hæmorrhages, *&c.* They are alſo as often, or more frequently, applied to retain other Medicines and Dreſſings upon the affected Parts. Sometimes Bandages are uſed to reduce and prevent the Enlargement of Tumours, and then they are uſually denominated *expulſive*. The Method of applying them for this Intention in the Legs when they begin to ſwell, is to begin at the Tarſus and Ancle, and to aſcend a little with every Round, as in *Tab.* III. *Fig.* 1. F. But ſometimes theſe expulſive Bandages are not only uſed for ſwelled Legs, but alſo to diſcharge the offenſive Matter in Fiſtulæ and Sinuous Ulcers. 'Tis alſo a very conſiderable Uſe in Bandages, to reſtore deformed Parts to their natural Shape; and recent Wounds themſelves will very often unite without any thing more than dry Lint with a fitting Bandage, eſpecially in the fore or hinder Parts of the Head, and in the Abdomen, and then the Bandage is commonly termed *uniting*: See *Tab.* XXXVII. *Fig.* 2 and 3. As for the other moſt particular Uſes of Bandages, applied to all the ſeveral Parts and Diſorders of the Body, that will in a great meaſure be the Subject of our Conſideration in the ſeveral ſucceeding Chapters, in which we ſhall endeavour to deſcribe, by Words and Figures, in the plaineſt manner both to the Eye and Underſtanding, all the moſt conſiderable Bandages that are, and may be uſed upon all Occaſions in the Art of Surgery, and from whence the Reader will eaſily be inabled to invent, and contrive others for any more particular or extraordinary Caſes that may occur in his Practice. Though it muſt be indeed confeſſed, that the Doctrine of Bandages may be much more readily and exactly learned from inſpecting the Examples and Demonſtrations made by an expert Maſter, than barely from Books alone. Nor is the Counſel of GALEN to be deſpiſed, who adviſes young Surgeons to make themſelves expert and ready in this important Branch of their Profeſſion, by the frequent Application of Bandages upon a ſound Perſon; in Defect of which he may commodiouſly uſe a Statue made of Linen, and ſtuffed in the ſhape of a Man. The uſing of a Statue has alſo this Advantage over a living Perſon, that the Operator may maim and diſmember it at pleaſure, to apply the ſeveral Bandages for Amputations, *&c.* which cannot be done upon the other. And, laſtly, for the Order or Method in which we ſhall conſider and deſcribe the ſeveral particular Bandages; you may obſerve, that we ſhall begin firſt with thoſe of the Head, then of the Neck, Thorax, and Abdomen, with thoſe of the upper and lower Extremities.

Uſes of Bandages.

CHAP.

CHAP. II.

Of the Bandages *belonging to the* Head.

The ſimple or triangular Kerchief.

I. THAT the Ancients had a prodigious Number of Bandages for the ſeveral Diſorders of the Head, may appear from the Writings of GALEN[a], and others, on this Subject; but as they alſo appear to have greatly multiplied their Number without any Neceſſity or Advantage, the Moderns, particularly VERDUC and LE CLERC, have judiciouſly endeavoured to eaſe the Learner in this Branch, by rejecting a great many of thoſe which are obſolete and unneceſſary; yet ſo as to retain many which they deſcribe, and are really uſeful for the ſeveral chirurgical Diſorders and Operations in the Head. Among theſe, the firſt is the *ſimple, or triangular Kerchief*, termed by the *French*, *le Couvre chef en triangle*, repreſented *Tab.* XXXVII. *Fig.* 1. *a a*, *b*. This Bandage may be made of a ſquare Handkerchief, Napkin, or a ſquare piece of Cloth folded together in Form of a Triangle, and applied with the middle of its longeſt Side upon the Forehead, bringing its two lateral Angles cloſe round the Head, and tying them behind over the other Angle, as is often done by Men who thus apply their Handkerchief inſtead of the common Covering of their Head, when their Exerciſe is in ſultry Weather. The Application of this Bandage is exceeding eaſy, and its Uſes extremely numerous; as it may be applied, not only in Wounds, but in almoſt all other Diſorders and Dreſſings of the Head, as any one may perceive by the Figure itſelf; but if the Knot *b*. proves uneaſy upon the Patient's Occiput, that Part of the Bandage may be turned round to the Forehead, and there faſtened with Pins.

The Grand Kerchief.

II. The ſecond Bandage of the Head, which is larger than the former, is termed the *Grand-Kerchief*, *(le grand Couvre-Chef)*; the Figure of which is repreſented in *Tab.* III. *Fig.* 1. A. and the Method of applying it deſcribed at Sect. LXVII. of our Introduction. 'Tis almoſt conſtantly uſed after the Operation of trepanning or boring the Cranium, and in dangerous Wounds of the Head, *&c.*

Sling with four Heads.

III. The third Bandage of the Head is a kind of *Sling with four Heads*, *Tab.* II. *Fig. d.* formed of a ſlip of Linen about an Ell long, and ſix or eight Fingers Breadth; though ſome will have it to be a Foot broad, and others make it but three Feet in length; and indeed we may allow of ſome Variation according to the Difference of Heads, and Methods of applying it. 'Tis generally uſed for retaining Dreſſing on a Wound of the Head in hot Countries and Seaſons, where the two preceding, and eſpecially the laſt might be too thick and cumberſome. The Band is ſlit up at each End, but not too near the middle, leaving a little more than an Hand's Breadth intire; ſee *Tab.* II. *Fig. d.* To apply it, ſuppoſe for a Wound in the upper Part of the Head, the unſlit Part of the Bandage is to be fixed upon the Compreſs and Dreſſings, and there held by the Hand of an Aſſiſtant, while the Operator carries the two poſterior Heads down under the Chin, tying them in a Knot as at *Tab.* III. *Fig.* 1. if the Bandage is long

[a] Conſult GALEN *de Faſciis*, as alſo GESNERUS, who are both excellent Writers on this Branch of Surgery: They deſcribe and figure ſeventy different kinds of Bandages for the Head only.

enough

enough by croſſing them there, and carrying them back to the Neck, where they may alſo be faſtened by a Knot, or pin'd [a]; the two foremoſt Heads are then to be faſtened by a Knot under the *Occiput*, or in a long Bandage, they may croſs each other there like an X, and then be carried up over the Ears, and tied upon the Forehead, or under the Chin.

A ſecond Sling with ſix Heads.

IV. Some Surgeons uſe, inſtead of the preceding, *a Sling with ſix Heads*, about three Feet long, and one broad, ſufficient to take in the whole Head. An Idea of it may be had from *Tab.* XXXVII. *Fig.* 19. ſuppoſing the two Apertures to be abſent. The middle of the Bandage being applied and held to the Vertex of the Head by an Aſſiſtant, the two middle Heads are then to be tied under the Chin, *Tab.* XXXVII. *Fig.* 2. *a a a*; the two anterior Heads are to be tied or pin'd under the *Occiput b*, and the two poſterior Heads faſtened upon the Forehead *c c c*, by the Knot *d*. Some will have this Bandage to be much larger, and the Application of it to be made by beginning with the poſterior Heads; but theſe are Matters of no Conſequence. As this Bandage, when it is juſtly applied will ſtick cloſe to the Head, and very well retain any Dreſſing upon that Part, when wounded, *&c.* I think we ought not to reject the Uſe of it. I ſhall here obſerve, once for all, that when we mention an Ell long, *&c.* you are to underſtand the *Paris* Ell, which is near four *Engliſh* Feet, as Merchants are well acquainted with: And this I thought neceſſary, to prevent Miſtakes from the Variation of this Meaſure in different Countries.

Uniting Bandage of the Head.

V. The fourth Bandage of the Head is by Surgeons termed from its Uſe, the Uniting or Incarnative. It is about two Ells long and two Inches broad, having a longitudinal Fiſſure or Slit in its middle, about the Length of three or four Fingers Breadth: (See *Tab.* II. *Fig. f.*) it is then rolled up at each end. The chief Uſe of this Bandage is to retain the Lips of a rectilinear Wound cloſe together, whether in the Head, Eye-lids, or other Parts of the Body. See *Tab.* XXXVII. *Fig.* 3. and 4. *a a.* For the Method of applying it; after the Wound has been dreſſed with proper Balſams, a Plaiſter and two narrow Compreſſes, laid one on each Side, the ſlit Part of the Bandage *b*, is then to be fixed near the Wound in ſuch a manner, that one of its Ends *c*, being carried round the Head, and its Roller being paſſed through the Slit, both of them *d d*, are then drawn tight, ſo as to bring the Lips of the Wound cloſe together. The two Rollers in each Hand being then exchanged, and croſſed upon the Forehead, as in *Fig.* 3. and the like being done under the *Occiput* and Chin, as long as the Bandage will permit, each End of it being faſtened, as alſo of the other Bandages, either by Pins or Suture. If the Wound be too long for its Lips to be thus approximated, you may in that Caſe make another Slit in the moſt convenient Part of your Bandage, and ſo tranſmit and exchange your Rollers as before, which will promote not only the Agglutination of the Wound, but alſo the Uniformity of the *Cicatrix*. This Bandage ſhould not be taken off for ſix, eight, or more Days after its Application, when the Lips of the Wound may be ſuppoſed to have united; unleſs any urgent Symptoms ſhould require its Removal.

[a] As Bandages of the Head being faſtened by a Knot in the Neck, may be uneaſy to the Patient in ſleeping on his Pillow, if the Ends will not reach to tie upon the Forehead, they had better be ſew'd or pin'd.

Bandage for Bleeding in the Forehead.

VI. The Bandage uſually applied after Bleeding in the Forehead, is about three Ells long and two Fingers Breadth. It is rolled up with but one Head, and may be applied after two different Manners; one of which is called the *Diſcrimen*, and the other the *Scapha*.

1. *Diſcrimen.*

The *Diſcrimen* is made by ſo placing the Bandage with the left Thumb upon a Compreſs covering the Wound or Puncture *a*, *Fig.* 5. as to let about a Foot of it hang down from the Forehead over the Face; after which, the Roller End of the Bandage in the right Hand is carried round the Temples and *Occiput*, 'till it comes again to the left Thumb upon the Forehead, in the circular Direction *b b*; the pendulous Part of the Bandage is then turned back upon the Forehead over the circular, coming down from the *Vertex* over the *Occiput*, in a ſtrait Direction upon the ſagittal Suture *c*, its End being faſtened upon the *Occiput*, by continuing the Roller End of the Bandage circularly about the Head as long as it will reach, faſtening its Extremity, either by Pin or Suture, upon the Part where it terminates.

2. *Scapha.*

In the *Scapha* the Bandage is carried round the Head in an oblique Circle (*Fig.* 6. *a*, *b.*) above the right Ear *b*, to the *Occiput*, and then under the left Ear, and again to the Forehead; then the pendulous Part is reflected back obliquely above the Ear on the other Side of the Head to the *Occiput*, forming a kind of Angle there, and upon the Forehead; ſo that the Parts *a*, *b*, *c*, inveſt the Head like a Boat, whence its Name. The Remainder of the Bandage is to be carried circularly round the Head, and faſtened, as before, in the *Diſcrimen*.

Bandage for Arteriotomy.

VII. The ſixth Bandage of the Head is, from the manner of its Application, ſometimes called *knotted*, from its many Croſſings on the Temples; and *ſtellar* or *ſolar*, from its Direction in *Radii*; making a very uſeful Bandage[a], when the temporal Artery is divided either in Arteriotomy, or by an accidental Wound, hardly ever failing of Succeſs in ſuppreſſing the Hæmorrhage. The Slip of Linen for this Bandage ought to be five or ſix Ells in Length, of two Fingers Breadth, and rolled up with two Heads. For the Application of it, after the Wound has been covered with three thick Compreſſes, each larger than the other, the middle of the Bandage is then applied to the ſound Temple oppoſite to the Wound, (*Tab.* XXXVII. *Fig.* 7.) and bringing one Head of it round the Forehead *a*, and the other round the *Occiput b*, they then meet, and croſs each other upon the Part affected *c*, forming a ſort of Knot, from whence one Roller is carried under the Chin *d*, and the other over the *Vertex* of the Head *e*, both of them croſſing each other again upon the ſound Temple on the right Side, from whence the two rolling Heads of the Bandage are carried round the Forehead and *Occiput*, to the Compreſſes on the Part affected *c*; and thus you are to continue 'till the Bandage is ſpent, when the two Extremities are to be faſtened by Suture.

After an Extirpation of the Parotids.

VIII. Almoſt the ſame kind of Bandage may be ſucceſsfully applied, with a little Variation, to ſuppreſs the Hæmorrhage after Wounds in, or an Extirpation of, the Parotid and maxillary ſalival Glands, when they are become ſchirrous. In theſe Caſes, after the Parts have been dreſſed with Styptics, Lint, and Compreſſes, the Bandage is then fixed upon the ſound Side, as be-

[a] And I therefore wonder it ſhould be omitted by ſeveral of our modern Writers.

fore,

fore, after Arteriotomy; but *(see Fig.* 8. *a, b, c, d, e,)* after the firſt Circumvolution all about the Head in that manner, I often repeat the Tract *(d, e,)* over the *Vertex*, and down under the Chin, and ſeldomer that round the Forehead and *Occiput*, than in the preceding Bandage; and inſtead of making the Knots or Croſſings upon the Temples, as before, they are here fixed upon the Parotid, or wounded Part, under the Ear, at the Angle of the Jaw *f*; and by frequently repeating them there, the Lint and Compreſſes are ſo ſtrongly preſſed upon the Part, as to prevent any Danger of a ſucceeding Hæmorrhage, always faſtening the Extremities by Suture, to prevent their getting looſe. I was obliged to contrive this Bandage when I firſt undertook the Extirpation of the forementioned ſcirrhous Glands, where I found it anſwer Expectation: nor is it without Reaſon that theſe two Bandages are called *knotted*, from their many prominent Croſſings.

The Capeline for an Hydrocephalus.

IX. The reflex Bandage of the Head, for an *Hydrocephalus*, termed by the *French* a *Capeline*, is about ſix Ells long, two fingers breadth, and rolled up with two Heads. It is applied by fixing its middle upon the *Occiput*; and, after one or two circular Rounds, the two Rollers are then made to traverſe or decuſſate each other upon the Forehead and the *Occiput*; then one Roller being reflected a-croſs over the *Vertex* and ſagittal Suture to the Forehead, *(Fig.* 9. *a.)* and the other carried in a Circle by the Side of the Head *b, e*, they then both croſs each other upon the Forehead: after this, the firſt Head of the Bandage is carried obliquely towards the *Occiput c d*, and is re-inverſed by the Side of the other, *a*; which laſt is continued in the circular Direction *b, c*, and then firſt carried from *e* to *f*, then from *g* to *h*, croſſing, while the other ſtill continues its circular Courſe. When this Reverſion has been continued till the Head is covered, and the Bandage almoſt ſpent, in order to faſten down the Reverſions of the Bandage *c d*, *e f*, *g h*, which traverſe each other obliquely, you are to finiſh by carrying one End over the ſagittal Suture *a*, and the other End in a circular Direction round the Head *b c*. Some recommend this Bandage for the Head-ach, as well as an *Hydrocephalus*; but of how little Service it can be of in the laſt, we may conclude from the Obſervation of *Nuck in Exper. Chirurg.* XVII.

The Monoculus.

X. We come now to thoſe Bandages of the Head which are deſtined to the Eyes, of which there are two kinds, termed the *Monoculus* and the *Binoculus*, according as they take in either one or both of the Eyes. The firſt of theſe Bandages is two Ells and a half or three Ells long, and two or three Fingers Breadth, according to the Bulk of the Patient, and ſerves to retain the Dreſſings upon either of the Eyes, or their Lids, in their ſeveral Diſorders. For the Application of it, you place the end of the Bandage, which is rolled up with but one Head, upon the *Occiput*, and from thence carry it obliquely round the Head and Ear of the affected Side, ſo as to croſs over the Compreſs and Dreſſings upon the Eye, *Fig.* 10. *a a*, and ſo obliquely over the Forehead *b*, down to its beginning at the *Occiput*. When you have thus carried your Bandage thrice obliquely round, the reſt is to be ſpent in a circular manner *c c c*, upon the Temples, *Occiput*, and Forehead, faſtening the End where it terminates. A Bandage or Sling for one Eye may be alſo very eaſily applied as repreſented at *Fig.* 11.

The Binoculus.

XI. The Bandage for inveſting both the Eyes is generally termed *Binoculus*, being about three Ells long, and as many Fingers breadth. There are two Ways of applying it, according as it is rolled up with one or two Heads.

1. With one Head.

When it has but one Head, the End of the Bandage is firſt applied, and held upon the *Occiput*, as in the preceding, and from thence it is carried round by the left Ear *a*, (*Fig.* 12.) and Eye *b*, obliquely to the right Side of the Forehead *c*, and from thence to where it began at the *Occiput*, from whence it aſcends obliquely again to the Forehead *d*, thence croſſing over the other Eye *e*, from whence it deſcends again to the *Occiput*, croſſing the former Round upon the Noſe, in the Shape of an X. Having repeated theſe two oblique or interſecting Circles thrice with your Roller, the reſt of the Bandage is to be ſpent in a plain Circle round the *Occiput*, Temples, and Forehead, in the Direction of *ggg*, faſtening the End wherever it terminates.——

2. With two Heads.

2. When this Bandage is rolled up with two Heads, then its middle is applied to the *Occiput*, and the two Rollers carried round on each Side by the Ears, and over the Eyes, *Fig.* 12. *a*, *b*, *f*, *e*, croſſing each other like an X upon the Noſe, where the two Rollers exchange Hands and Directions, paſſing over the Temples *a*, *c*, again to the *Occiput*, where they are again croſſed and exchanged, and ſo brought round and croſſed upon the Noſe as before; which Courſe being repeated thrice, the Remainder of the Bandage is applied in a plain circular Direction round the Head *ggg* [a]. The Application of this Bandage, when both the Eyes are affected, may be very well ſupplied by the Sling *Fig.* 11. If two are applied, one on each Eye, and their Ends tied with a Knot upon the *Occiput*, or after croſſing each other there, they may be pin'd near the Ears or Temples.

Sling for the Noſe.

XII. There is one Bandage or Sling which very well ſupplies all Occaſions of the Noſe, being uſually about an Ell long and three Fingers breadth, ſlit at each end, and rolled up with four Heads. The Slits are continued almoſt to the middle, leaving but about two Fingers Breadth entire. Betwixt the two Slits is made a ſmall Aperture to intercept the *Apex* of the Noſe, and hold the Bandage firm. See *Fig.* 13. *a*. The chief Uſe of this Bandage is for Fractures of the Noſe, or to retain the Dreſſings in Wounds and Inflammations of that Part, or after the Extirpation of a *Polypus*, or making a Perforation when the Noſtrils are obſtructed by ſome Membrane, *&c.* It is applied by fixing its middle upon the *Apex* of the Noſe, and carrying its two upper Heads *bb*, backward to the Neck on each Side, where croſſing each other, they are carried up, and tied upon the Forehead *cc*, by the Knot *d*; but the lower Heads of the Bandage *ee*, are carried a little upward over the Cheeks and Temples *f*, and then croſſing upon the *Occiput*, are tied like the preceding upon the Forehead *gg*. We ſhall conclude with this general and neceſſary Obſervation, that in all four-headed Bandages, the two uppermoſt Heads are to be carried not directly backward, but a little obliquely downward, and the two

[a] The Method of applying theſe Bandages for the Eyes, is delivered in a very different, but much more obſcure and intricate manner by GALEN, in his Book *de Faſciis*.

[b] The Ancients have invented and deſcribed two other Bandages, beſides this for the Noſe, one of which they call *Accipiter*, and the other the *Foſſa* of AMYNTAS; but as thoſe rather diſturb than retain the Bones of the Noſe in their proper Places, HIPPOCRATES juſtly adviſes to reject them, ſince a Plaſter only will generally ſuffice for their Support.

lower

lower a little obliquely upward, croſſing each other as in this Figure, to retain the Parts more firmly.

The ſingle Bridle.

XIII. When the lower Jaw is fractured or diſlocated on either Side, the Surgeon muſt apply the Bandage termed a ſingle *Bridle (Capiſtrum ſimplex)* which is near four Ells long, about two or three Fingers breadth, and rolled up with one Head. It is thus applied: The Luxation being properly reduced and dreſſed, the looſe End of the Bandage is to be fixed on the *Occiput*, and faſtened there by making two Circumvolutions about that and the Forehead, *Fig.* 14. *a*, *b*, then the remaining Part of the Bandage being made very faſt to the other, either by pinning or ſewing upon the Temple of the affected Side *b*, is carried down over the Cheek *c*, and under the Chin *d*, and from thence it is conveyed up on the ſound Side of the Head over its *Vertex e*, again to the affected Side *b*, *c*, *d*. After this Proceſs has been thrice performed, the remaining Part of the Bandage is carried from the Throat to the Neck, under the Ear, and ſo round upon the anterior Part of the Chin and lower Jaw affected *f*, *g*, from whence again it paſſes under the Ear on the ſound Side, round the Neck, and ſo over the Chin once more; and laſtly, the remaining Part of the Bandage, if there be any, is carried from the *Occiput* to the Forehead, falling into the Circle *a*, *b*, till it is ſpent. But you muſt obſerve that, in order to keep this Bandage tight and faſt upon the Parts, the croſſing of it *b*, *f*, upon the Temple and lower Jaw ought to be ſewed or pin'd together. This Bandage is equally applicable as well for Fractures as Luxations of the lower Jaw.

The double Bridle.

XIV. When both Sides of the Jaw are fractured, after the Reduction you muſt apply the *double Bridle (Capiſtrum duplex)* which is a Bandage ſix Ells long, and two or three Fingers breadth, rolled up with two Heads, the Fracture being reduced, and the Dreſſings held on by an Aſſiſtant, the middle of the Bandage is placed under the Chin *(Fig.* 15. *a*, *b)* and from thence carried up on each Side of the Jaw and Temples, the Rollers croſſing each other upon the *Vertex c*, from whence they are carried down again under the Chin as before, repeating this Courſe three times; and after the laſt croſſing upon the *Vertex*, they muſt deſcend from thence to the Neck, where they are croſſed, and then carried on each Side, ſo as to paſs round the anterior Part of the Chin and lower Jaw *d*, *e*, they are then carried round again to the Neck; from whence, after croſſing, they proceed to the Forehead, where they form the circular Turns *b*, *f*, *f*; after which, not only the Ends of the Bandage, but alſo its Croſſings upon the *Vertex* and Temples, are to be well faſtened by Pins or Suture. But after all, the preceding ſimple Bridle appears no leſs ſuitable for the ſame Purpoſe than this, which is more complex.

Sling with four Heads for the Jaws.

XV. There are ſome Surgeons, who, inſtead of the Bridle, uſe a Sling or four-headed Bandage, a little above an Ell long, and of four, five, or ſix Fingers Breadth being perforated in the middle for intercepting the Ball of the Chin, which is not only more ſimple than the former, but alſo anſwers the ſame Intention extremely well; ſee *Tab.* XXXVII. *Fig.* 16. After the Fracture or Luxation has been reduced, and the proper Dreſſings applied, the Chin is then let into the Aperture in the Bandage *a*, *Fig.* 17. *a*, and then the two upper Heads are carried back to the Neck, where the Rollers or Ends being croſſed and exchanged on the Occiput, are from thence conveyed to the Forehead *c c*, and there tied by the knot *d*; but the two lower ends of the Bandage *e*

are

are carried upward by the ſides of the Checks *f*, to the Crown of the Head, and there faſtened by the knot *g*, or elſe carried down again, when the Bandage is long enough, and tied under the Chin.

Bandage for the Lips. XVI. After the Operation for the Hare-lip, Wounds, *&c.* for retaining the Dreſſings, Surgeons apply a kind of ſling with four Heads, almoſt like that for the Noſe, deſcribed in Sect. XII, but no more than an Inch broad. This Bandage is applied by fixing its middle, which is without any ſlit, upon the Lip *a*, *Fig.* 18. and then the two upper Ends *bb* are firſt carried back to the Neck, and from thence to the Forehead, upon which they are either tied by the knot *c*, or elſe pin'd; but the two lower Ends *dd* are carried a-croſs the Cheeks *ee*, to the Occiput, and from thence to the Forehead, where they are faſtened like the former. I know that ſome Surgeons apply the uniting Bandage *Tab.* II. *Fig. f*, of an Ell long, and a Finger's breadth, having a longitudinal Slit in its middle about two Fingers breadth long, which they apply to the Hare-lip, in the ſame manner as we directed for the uniting Bandage of the Forehead; ſee *Tab.* XXXVII. *Fig.* 3. But that kind of Bandage is not only leſs convenient for this Uſe, as it compreſſes the Needles too violently, but it is, on many accounts, even injurious and improper, as we are aſſured both from Reaſon and Experience.

The Maſk. XVII. When the whole Face has been burnt by Gunpowder, or other Fire, we uſually form a piece of Linen-cloth into a kind of Maſk, with Apertures for the two Eyes, Noſe, and Mouth; which Cloth being armed with ſome Oil, Ointment, or other Medicine for Burns, as we before directed in our Chapter on that Subject, is then commodiouſly applied to the Face, and faſtened behind the Occiput by ſix Tapes, or Slips of the ſame piece of Linen. This Maſk may alſo ſerve to retain the Dreſſings for a *Phlegmon*, *Eryſipelas*, or other Diſorder of the Face.

CHAP. III.

Of Bandages for the Neck.

The Divider for the Neck. I. AMONG the Bandages commonly uſed for the Neck, the firſt that deſerves our Conſideration is the *Divider*, ſo called from its dividing or drawing back the Head, that it may not grow to the Breaſt, nor be contracted forwards, in Burns of thoſe Parts. 'Tis made of a ſlip of Linen ſix Ells long, and about two or three Fingers broad, rolled up with two Heads. The burnt Parts being dreſſed, the middle of the Bandage is applied upon the Forehead, making two Rounds there about the Head, *Fig.* 21. *aa*, and then one of its Rollers is carried under the right Axilla *b*, and its other under the left [a] *c*, making two Rounds about the Breaſt *dd*, to keep the Head erect; but then the Parts of the Bandage croſſing upon the Head are to be faſtened by Pins; ſee *Fig.* 21. *a*, either together, or to the Patient's Cap. This done, the two

[a] It muſt be obſerved, that a thick Compreſs ought to be placed under the Bandage at every time bringing it under the Axilla, to prevent its fretting off the Skin.

Heads

Heads of the Bandage are again carried up to the Neck, where, croſſing each other like an X, they then paſs over the Forehead, and from the Forehead they go again to the Neck, and ſo under the Arms, keeping the Head all the time in an erect Poſture, and ſpending the remainder of the Bandage circularly about the Forehead and Occiput. When the Bandage ſlackens, it is to be renewed again, and continued till the Parts are in no Danger of contracting. Some alſo recommend this for ſupporting the Heads of Infants, when they cannot hold them upright, through ſome Weakneſs in the extending Muſcles of the Head.

II. Another Bandage proper to the Neck, is uſually termed *Retentive*, as it ſerves to keep on the Dreſſings and topical Remedies applied to the Neck after Bleeding, Burns, or any chirurgical Operation in that Part. This Bandage is generally compoſed of two ſimple Bands, one of which is about an Ell, and the other an Ell and a half in length, the firſt being of a Thumb's breadth, and the laſt of three Fingers, to be applied in the following manner: Firſt, the Dreſſings being applied, the ſhorteſt of the Bands is to be then laid a-croſs the Head over the Vertex, ſo as to let its two ends hang down over the Shoulders, as in *Fig.* 22. *a a*, after which the longer Band is to be applied circularly *b b* about the Neck, and over the other Band, making it as tight as may be without obſtructing the Reſpiration, and when it is thus ſpent, faſten the end with a Pin. Laſtly, the two ends of the firſt Band *a a* lying on the Shoulders, are to be next reflected and drawn upwards over the circular one, in the manner denoted by *c*, faſtening them under the Ears, that the circular Bandage may not deſcend. But, to ſay Truth, this ſhorteſt Band, marked *a, c*, is of little or no Service; becauſe the Shoulders alone are ſufficient to prevent the circular Bandage from ſubſiding, as I have learned from Experience.

Retentive Bandage for the Neck.

III. There ſtill remains a third Bandage of the Neck, which is generally applied after the Operation of *Tracheotomy*, which being performed, and the Canula fixed in the Aperture made in the *Trachea*, you muſt then apply a common ſimple Bandage of about two Foot long, and two Inches broad, perforated in its middle, and applied over a Plaſter, and Compreſs perforated in the ſame manner, and then gently drawing the two ends tight behind the Neck, they are to be faſtened by a Knot there. You may alſo apply for this ſame purpoſe a Bandage of three Feet long, two Inches broad, and rolled up with one Head: Firſt, fix its End upon the Neck, and then make two circular Turns about the ſame; but when it comes to the Canula inſerted in the *Trachea*, that Part of the Bandage muſt be perforated to let the Tube through, and give a free Admiſſion to the Air to come that way into and out of the Lungs, faſtening the end of the Bandage wherever it terminates with a Pin. The Bandages are ſeldom renewed before the Patient has recovered his Reſpiration, and then the Tube being removed, and the Wound dreſſed with ſome vulnerary Balſam and a ſticking Plaſter, you are then to bring its Lips together by means of an uniting Bandage, (*Tab.* II. *Fig. f.*) which may be an Ell long, and of two Finger's breadth, applied as in other rectilinear Wounds of the Forehead, *&c.* (*Tab.* XXXVII. *Fig.* 3. *a.*)

Bandage for Tracheotomy.

CHAP.

CHAP. IV.

Of Bandages pertaining to the Thorax.

SECT. I.

Of Bandages for the Clavicle, *when it is either broke or luxated.*

The Capeline.

I. THERE are two ſorts of Bandage for the Clavicle, according as it is either broke near the Sternum or Humerus; for in the firſt ſhould be applied the *Capeline*, (or *capitalis reflexa*) of ſix Ells long, three or four Fingers Breadth, and rolled up with two Heads; to be applied as we before directed in our Chapter on a Fracture of this Bone, or in the following manner: The fractured Clavicle having been reduced and retained by proper Compreſſes and Splints of Paſteboard, (*Tab.* VIII. *Fig.* 12.) the Dreſſings are to be held on by the Hand of an Aſſiſtant, while the Surgeon applies the middle of the Bandage to the top of the Patient's Shoulder, *Fig.* 23. *a.* So that the Roller, on the fore-ſide, may paſs obliquely over the *Præcordia b.* and the poſterior Roller or Head may paſs obliquely upon the Back betwixt the *Scapulæ* to the *Axilla c.* on the ſound ſide, and, paſſing under the Arm, come a-croſs the Breaſt *d*, and, paſſing over the anterior Roller-head, continues its Courſe round under the Arm of the affected Clavicle *e* to the Back; and then the anterior Head of the Roller is reflected back again over the affected Shoulder *f*, after it has been croſſed and ſecured by the other Head of the Roller on the Back, which laſt, being again brought towards the Thorax, is to croſs the other upon the Breaſt, before it is again returned over the Shoulder in the Direction *g*, *h.* and thus you are to continue as long as the Bandage laſts, or till the Splints, Compreſſes, and other Dreſſings are well covered, and firmly ſecured upon the fractured Clavicle. Laſtly, the ends of the Bandage are to be faſtened, by pinning where they terminate, and the Arm muſt be ſuſpended in a Sling or Saſh about the Neck, as at *Tab.* XXXVIII. *Fig.* 17. *c c.* When the Surgeon finds it difficult to retain the Fracture by this Bandage alone from the Weight of the Arm, diſplacing the reduced Fragments, he may, in that Caſe aſſiſt it by another Bandage, which in a manner draws back and ſuſpends the Shoulders, termed the *Stellate*, from its Figure, and applied as follows.

The Stellate Bandage.

II. Take a ſingle-headed Roller, of four or five Ells long, and three Finger's breadth, fix the end of it upon a Compreſs near the Clavicle, or under the Axilla of the ſound Side: (*Fig.* 24. *a*) conduct it from thence obliquely over the ſame Shoulder, and acroſs the Back betwixt the Scapulæ to the top of the Shoulder of the fractured Clavicle *b*, and then under the ſame Axilla *c*, thence obliquely a-croſs the Back betwixt the Scapulæ, over the other Shoulder *d*; ſo that the Courſes may interſect or traverſe each other like an X in the middle of the Back: And thus the whole Bandage is to be ſpent in vertical Turns about the Shoulders, and under the Arms, like an horizontal Figure of (∞). Whenever the Bandage appears ſlack, it ought to be tightened, or freſh applied about once in two or three Days; but then the Shoulder muſt be held extended by an Aſſiſtant whilſt it is off, and at other Times the Patient muſt conſtantly keep his Arm in the Sling, *Tab.* XXXVIII. *Fig.* 17. You may alſo begin

begin to apply this Bandage by fixing its end upon the Shoulder above the Scapula *d*, inſtead of under the Axilla; and from *d* you conduct it along by *e* and *c* to *b*, thence by *e* and *a* to *d* again, and ſo on till it is ſpent. Laſtly, you may obſerve, that the Machine delineated in *Tab.* VIII. *Fig.* 13. may be ſometimes conveniently uſed for the ſame Intention as the preſent Bandage, and inſtead of it, as we have mentioned in our Chapter on the Fracture of this Bone.

III. When the Clavicle is fractured near the Shoulder, the moſt convenient Bandage for that Caſe is the *Simple Spica*, ſo called from its Interſections, being ſuppoſed to reſemble an Ear of Corn; it has been alſo denominated *Geranium* ever ſince the Time of HIPPOCRATES[a]. It conſiſts of a common or ſimple Band, about five Ells long, and three Finger's Breadth, rolled up with one Head. The Fracture being reduced, and the Compreſſes or Dreſſings held on by an Aſſiſtant, the end is fixed on a Compreſs under the Axilla, and the Roller is paſſed from thence to *a*, (*Tab.* XXXVII. *Fig.* 25.) obliquely a-croſs the Breaſt *b*, over the fractured Clavicle *c*, and paſſing backward upon the *Acromion Scapulæ*, comes up again obliquely from under the Axilla *d*, ſo as to interſect, or croſs over the preceding Round at *c*, where, covering the Part affected, it thence proceeds obliquely a-croſs the Back, and under the oppoſite Arm *a*. The Bandage being thrice paſſed about the Patient in this manner, the remainder of it may be either ſpent in the ſame Courſe, or in a circular Direction about the Arm or Shoulder of the affected Side, its End being faſtened either by a Pin or Suture. In this Caſe too the Patient's Arm muſt be ſuſpended in a Sling; and, above all, the Surgeon muſt obſerve, that the Parts are held in their juſt Poſition while he applies the Bandage, which ſhould be firm and tolerably tight; the Patient ſhould alſo keep his Arm quiet, for which end ſome faſten or bind it to their Breaſt by a circular Bandage for that purpoſe. The ſimple Spica.

Others make their Bandage of the *ſimple Spica*, by beginning under the Axilla of the ſound Side, *Fig.* 25 *a*. from whence they proceed obliquely a-croſs the Back, and over the other Shoulder, taking in the fractured Clavicle itſelf *c*, and having paſſed under the Axilla *d*, it is then carried up on the Back of the Shoulder, and interſecting the former at *c*, it goes obliquely a-croſs the Breaſt *b* to the oppoſite Axilla *a*, where it began; and thus they continue till the Bandage is ſpent, faſtening its end wherever it terminates. The Uſefulneſs of theſe Bandages in a Fracture or Luxation of the Clavicle is ſelf-evident; beſides which it may be alſo applied with Advantage in a Luxation of the upper Head of the *Os humeri*, and in a Fracture of its Neck. Second Method of applying.

IV. This Bandage may be alſo applied in another manner, being ſomething larger than the firſt, and rolled up with two Heads. In this Method the middle of the Bandage is fixed under the Axilla of the ſound Side, *Fig.* 25. *a*, its anterior Head paſſing obliquely over the Præcordia, and its Poſterior a-croſs the Back to the Shoulder of the affected Side *c*, where the Heads croſſing each other, are then carried down, and croſſed again under the Axilla *d*, and, riſing up, they croſs again upon the Shoulder *e*, from whence they are carried one before, and the other behind obliquely upon the Breaſt and Back down to, and Simple Spica with two Heads.

[a] See GALEN *de Faſciis*.

under the right or ſound Axilla, where, being again croſſed, they continue the ſame Courſe as before, till the whole Bandage is ſpent, and the Clavicle well covered and ſecured. The ſame Cautions are here neceſſary, with regard to ſuſpending the Arm in a Sling, and retaining the Parts in their due Poſition, as before.

A fourth Method of applying the Spica.

There is ſtill another Method of applying the double-headed *Spica*, by fixing the middle of the Bandage under the Axilla of the Side affected, *Fig.* 25. *d*, then carrying up the two Heads, and croſſing them upon the Shoulder *e*, from whence, drawing them tight, they paſs a-croſs the Breaſt and Back to the right Axilla *a*, where they croſs each other, and then return again by the ſame Courſe to the Shoulder *c c*, upon which again being croſſed, they then paſs under the left Axilla *d*, where the Bandage firſt began; and thus the preceding Courſe muſt be repeated till the Bandage is ſpent, and the affected Parts well covered and ſecured. Some of our modern Surgeons, following GALEN and the Ancients, apply Part of this Bandage like a kind of Sling or Bridle about the lower Arm, in order to ſuſtain it; but as by that means the fractured Clavicle will be drawn downward by its ſuſtaining the Weight of the Arm, I ſhould rather approve of making a Support or Sling for the Arm to be hung about the Neck, as in *Tab.* XXXVIII. *Fig.* 17.

GOUEY's Method of applying the Capeline.

V. We have yet another Method of applying the *Capeline* different from the preceding, though generally neat and commodious, deſcribed by Monſieur GOUEY in his *Chirurgie Veritable*, pag. 108. which Bandage may, in ſome reſpects, be preferred, as being applicable when the Clavicle is fractured in any Part or Direction. His Capeline is ſix Ells long, three Fingers breadth, and rolled up with two Heads. 'Tis applied by fixing the middle of the Bandage under the Axilla belonging to the affected Clavicle; (ſee *Tab.* XXXVII. *Fig.* 25. *d.*) and, carrying up the two Roller-heads, they croſs each other like an X upon the top of the Shoulder, and then proceed one a-croſs the Breaſt *b*, and the other a-croſs the Back to the Axilla *a*, where they are croſſed, and then carried circularly round the Body, and croſſed again under the Axilla of the affected Clavicle *d*, then carried up and croſſed upon the Shoulder, as before, and ſo continued till they return again to where the Bandage began. He then takes the poſterior Roller-head, and, bringing it over the Shoulder, croſſes and ſecures it upon the Breaſt by the other Head (as at *Fig.* 23. *a*, *b.*) which is ſpent circularly round the Body; and after the poſterior Head has paſſed under the anterior, it is then reflected back again in the Direction *f*, and, being ſecured as before by the circular Turn on the Back, it then returns, and ſo continues till it is ſpent, as in Sect. I. of this Chapter. The Author of this Bandage prefers it to any other, as it retains and ſecures the reduced Fragments of the Clavicle in all Directions, as well downwards as laterally, towards the Sternum and Humerus. M. GOUEY alſo judges, that this Bandage is better than the common ones for a Fracture of the Scapula.

Bandage for a luxated Clavicle.

VI. The Bandage for a Luxation of the Clavicle is almoſt the ſame as for a Fracture of that Bone, *i. e.* after it has been replaced or reduced (according to the Directions given in Sect. VI. of our Chapter on a *Luxation of the Clavicle)* a Compreſs is to be applied dipt in *Sp. Vini*, and retained, if the Diſlocation be of that end next the Sternum, by the capeline Bandage here deſcribed at Sect. I. and V. and, if the Clavicle be preſſed inward, it will be alſo neceſſary to

to apply the Stellate Bandage at Sect. I. to keep the Shoulders extended, and throw the Clavicle outward; but that Bandage muſt be omitted when the Bone is diſlocated outward, when it will be rather neceſſary to preſs it inwards by a tight Bandage and thick Compreſſes. If that Head of the Clavicle next the Scapula be diſlocated, your Bandage muſt then be the *ſimple Spica* of Sect. III. and IV. or that of Gouey at Sect. V. preceding. And, laſtly, when both of the Clavicles are violently diſplaced, your Buſineſs is then to apply the *double Spica*, in the manner we ſhall preſently direct for Fractures and Luxations of the Scapula. In the mean time you muſt always obſerve to inculcate this neceſſary Caution to your Patient, that he may never violently agitate his Arm, or remove it out of the Sling, till the Parts are become firm, to prevent a Relapſe of the Diſorders.

SECT. II.

Of Bandages for the Humerus *and* Scapula.

VII. For a Diſlocation of the Humerus, after it has been replaced, and ſecured from ſlipping out again, by fixing a Ball in the Axilla, you are then to apply the *ſimple Spica* deſcribed at Sect. I, III, IV, or V. preceding. The Compreſs here muſt be a Foot long and a Hand's breadth, ſlit up at each end, ſo as to form four Heads, as in *Tab.* II. *Fig.* 18. this being expreſſed out of warm Wine, its Spirit, or *Oxycrate*, is to be applied with its middle upon the Ball under the Axilla, its four Heads coming up over the Shoulder or Head of the Humerus, which they are to inveſt: You are then to bind up the Part with the ſimple Spica, Sect. III, IV, or V, obſerving to place a Compreſs under the Axilla and Bandage, to prevent the Skin from being chafed. This *Spica* Bandage may be alſo very uſeful in a Fracture of the Neck or of the *Os humeri*, when the common Deligation for a Fracture of this Bone will by no means ſucceed. Simple Spica for a Luxation of the Humerus.

VIII. If the *Os humeri* of each Arm are diſlocated, the moſt effectual Bandage in that Caſe is the *double Spica*, as it is commonly called. When you have reduced the Bones, and ſecured them with a Ball or Pellet of Linen in each Axilla, with Compreſſes, as in our Diſcourſe of Luxations, you then take a Band about ſeven or eight Ells long, and three or four Fingers breadth, rolled up with two Heads, and fixing its middle under the Axilla *d*, (*Tab.* XXXVII. *Fig.* 25.) the two Heads croſs each other upon the Shoulder *e*, and go over the Breaſt and Back to the oppoſite Axilla *a*, where they croſs again, and then riſe up over the other Shoulder as before, from whence they go a-croſs the Breaſt and Back again to the left Axilla *d*, where they began, forming an X by traverſing each other upon the Sternum and Back, as you may ſee more expreſsly in *Tab.* XXXVIII. *Fig.* 4. And thus you are to continue your Bandage, croſſing the Thorax, and about each Shoulder, till, being near ſpent, the remainder may terminate circularly either about the Body, or one of the Arms, faſtening its ends by Pins. This *double Spica* is not confined barely to Luxations of the *Humeri* Bones, but it may be alſo advantageouſly applied for Fractures of the Clavicles inflicted near the Shoulders, or in any other Caſes where the Shoulders themſelves require a pretty tight Deligation. The double Spica.

IX. In a Fracture of the Scapula, after the Reduction, and dreſſing with Compreſſes and Splints of Paſteboard, as in our Diſcourſe of theſe Fractures, Bandages for the Scapula.

you may then take your Choice of three Bandages, the firſt of which is the *double Spica* deſcribed in the preceding Paragraph; the ſecond is the *Capeline* deſcribed in Sect. I, and V. preceding; the third and laſt is the *Stellate* Bandage delivered in Sect. II. foregoing, and which is the moſt frequently uſed for theſe Fractures, obſerving that the Scapulæ and Dreſſings are retained in their due Poſition during its Application. Though it muſt be alſo acknowledged, that the *double Spica* may be uſed to Advantage, when both Scapulæ are fractured, as any one may conceive from viewing the Courſe of the Bandage, ſince it cloſely inveſts both the Shoulders and Scapulæ.

An EXPLANATION *of the* THIRTY-SEVENTH PLATE.

Fig. 1. Shews the *triangular*, or *ſimple Kerchief* for the Head, in *French*, *Couvre chef en triangle*; *a a a* the Parts of it which inveſt the Forehead, Vertex, and Part of the Occiput, *b* its Corners tied upon the Occiput.

Fig. 2. Repreſents the manner in which the *Grand Kerchief*, or ſix-angled Bandage is applied; *a a a* its middle corners tied under the Chin, *b* one of its anterior Corners, which, with its Fellow, is carried round the Occiput, and faſtened on each Side near the Ears; *c c* are the poſterior Angles brought from the Occiput to the Forehead, and there faſtened by the knot *d*; *e e* the middle of the Bandage inveſting the Head.

Fig. 3. Demonſtrates the uniting Bandage of the Forehead; *a* the longitudinal Wound, *b* the ſlit in the Bandage upon the Wound, through which its other Part *c* is paſſed; *d d* the two Heads of the Bandage, by drawing which the Lips of the Wound are approximated or conjoined, and then they terminate circularly about the Head.

Fig. 4. Denotes the ſame Bandage applied to a longitudinal Wound near the Vertex.

Fig. 5. Exhibits the *Diſcrimen*, or Depart-bandage, *a* the Part where it begins, or where its middle is firſt applied; *b b* its circular Turns about the Head, *c* its depending Part reflected back towards the Occiput.

Fig. 6. Repreſents the *Scapha*, or Boat, *a* the Beginning of the Bandage, *b b* its firſt Round which is made obliquely about the Head, *c* the beginning of the ſecond Round continued obliquely from the left Side of the Occiput, and meeting with the other like the Ribs of a Boat; *a d d* the circular Rounds about the Head, in which the Bandage terminates.

Fig. 7. Denotes the knotted Bandage for arteriotomy in the Temples; *a b* the firſt Round made by the two Roller-heads, the middle of which being applied upon the ſound Temple, is brought round in the Direction *a b*, and croſſed upon the Compreſs on the divided Artery *c*, ſo as to form a Knot or Protuberance, after which they paſs round the Head in the oppoſite Courſe *d*, *e*, under the Chin, and over the Vertex to the ſound Temple, where they croſs again as before at *c*.

Fig. 8. *Litt. a*, *b*, *c*, *d*, *e*, denote the ſame Bandage; but with this Difference, that here the Knot *f* is made behind the parotid or ſalival Gland, here ſuppoſed to be extirpated.

Fig. 9. Shews the *Capeline* for an Hydrocephalus, *a* the depending End reflected back from the Forehead to the Occiput, *b c* the circular Round about the Head;

Fig 1.

Fig. 2.

Fig 3.

Fig 4.

Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

Fig. 20.

Fig. 22.

Fig. 21.

Fig. 18.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Fig. 13.

Fig. 14.

Fig. 15.

Fig. 19.

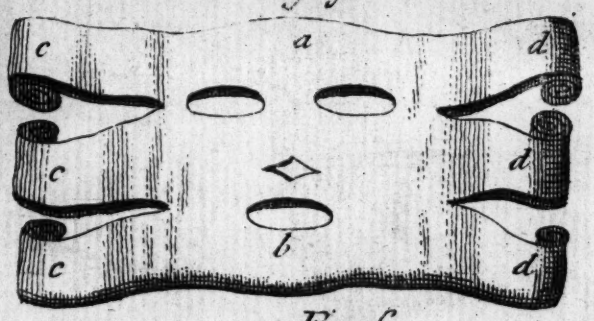


Fig. 16.

Fig. 23.

Fig. 17.

Fig. 24.

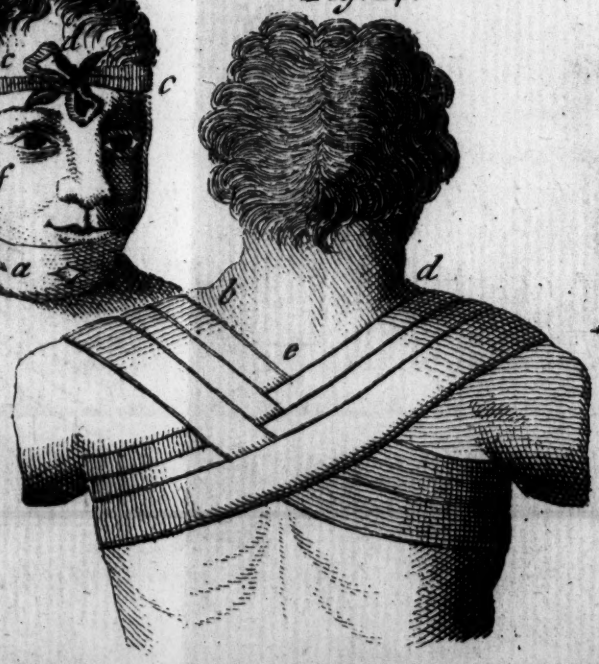
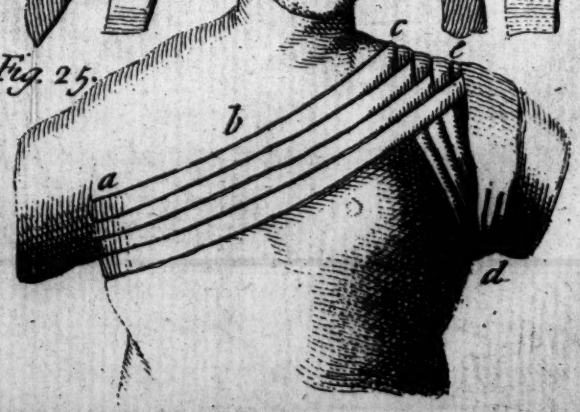


Fig. 25.



Head; *d*, *e*, *f*, *g*, *h*, the other oblique or reflex Turns which inveſt the Head.

Fig. 10. Demonſtrates the Bandage denominated *Monoculus*, for the binding up of one Eye; *a a* denote the firſt Round which paſſes from the Occiput round the Ear and Cheek, over the left Eye, and then over the Forehead *b* to its beginning at the Occiput; *c c c* the circular Rounds about the Temples in which the Bandage terminates.

Fig. 11. Exhibits the *Monoculus* formed of a Handkerchief rolled up, and tied obliquely about the Head.

Fig. 12. Repreſents the *Binoculus* for inveſting both Eyes, applied by bringing the Bandage from the Forehead to the Occiput in the Direction *a b c*, over the left Eye, and croſſing on the Occiput, it then covers the right Eye in the Courſe *d e f*, returning to the Occiput, and is finally ſpent in the circular Turns *g g g* over both the Eyes.

Fig. 13. Shews the Method of applying the Sling for the Noſe; *a* the Aperture in the middle of the Bandage which intercepts the Orbiculus of the Noſe, *b b* the two upper Heads which, being carried round the Temples and Occiput, are tied upon the Forehead *c c*, by the Knot *d*; *e e f f g g* denote the ſame with reſpect to its two lower Heads.

Fig. 14. Exhibits the *ſingle Bridle*, or Harneſs for the lower Jaw; *a b* the circular Turn about the Head, by which the Bandage begins to be applied, *b* the Place where the two Rounds, interſecting each other, are ſewed together, and then paſſing under the Jaw in the Courſe *c d e*, it is then turned a few times round the Chin and Occiput *f g*.

Fig. 15. Denotes the *double Bridle*, which is made with a two-headed Roller, whoſe middle is firſt applied under the Chin, and then paſſing on each ſide in the Direction *a b* to the Vertex of the Head *c*; the ſame Courſe is repeated ſeveral Times, and then it is paſſed round about the Neck and Chin, ſo as to inveſt the lower Jaw, upon the middle of which its Heads croſs at *e*, and being carried to the Occiput, they paſs from thence, and terminate circularly about the Temples and Forehead.

Fig. 16. Exhibits the Sling with four Heads for the Chin, *a* the Foramen in its middle, which intercepts the Chin, *b b b b* its four Heads or Ends.

Fig. 17. Repreſents the manner in which the preceding Bandage is fixed upon the Chin and lower Jaw, and its ends tied about the Head.

Fig. 18. Shews the Method of applying the Sling for the upper Lips, *a* its middle which is not ſlit, *b b* its two upper Heads, which are tied upon the Forehead at *c*; *d d* its lower Heads, which, being carried up over the Cheeks *e e*, are croſſed upon the Occiput, and then faſtened by a Knot upon the Forehead.

Fig. 19. Shews the Maſk for the Face, *a b* is the Maſk itſelf which inveſts the Face, and is tied on by its ſix Heads or Ends *c c c d d d* upon the hinder Part of the Head.

Fig. 20. The dividing Bandage viewed on the fore part of the Body, *a a* the circular Turns inveſting the Head, where it begins; *b*, *c*, the Turns which paſs under the right and left Axilla to the Back, where the Roller-heads change Hands, and are then convey'd circularly about the Thorax *d d*.

Fig.

Fig. 21. Repreſents a poſterior View of the foreſaid dividing Bandage, *a* the Place where the Roller-heads traverſe each other like an X; *b c* the Turns which go under each Axilla, *d d* the circular Rounds which inveſt the Thorax, and change their Courſes upon the Back.

Fig. 22. Shews the contentive Bandage for Bleeding, *&c.* in the Neck. See Chap. III. Sect. II.

Fig. 23. Exhibits the *Capeline* for a Fracture or Luxation of the Clavicle, which is made with a double-headed Roller, *a b* the firſt Progreſs of its anterior Head, *c d e* the circular Rounds about the Thorax made by its poſterior Head, which, riding over the former, binds it down tight before it is reflected back in the Series *f g h*.

Fig. 24. Demonſtrates the *Stellate Bandage* for the Clavicles and Scapulæ. It may begin under the Axilla *a*, and, forming its firſt Courſe *a b* over the left Shoulder, and under the ſame Axilla *c*, then traverſes its ſaid firſt Courſe at *e*, and, ſurpaſſing the right Shoulder *d*, paſſes again under the ſame Axilla at *a*, and ſo on as before; *e* denotes the Decuſſations of the Bandage, whence it has been denominated *Stellar*, from its imaginary Reſemblance to the *radii* of a Star. You may alſo begin this Bandage above either of the Shoulders at *b* or *d*, as well as under either Axilla *a c*.

Fig. 25. Repreſents the *ſimple Spica* for injuries in or near the Shoulder and Axilla. The middle of this Bandage is fixed under the ſound Axilla *a*, and aſcending croſs the Breaſt *b* and Back to *c*, its Heads there croſs, and paſs under the Axilla *d* of the affected Shoulder, upon which it riſes, and is croſſed again at *e*, then deſcending a-croſs the Breaſt and Back to the oppoſite Axilla *a*, it is there croſſed, and the ſame Courſe repeated as before. We have before deſcribed other Methods of applying this ſimple Spica at Sect. III, and IV. of Chap. IV.

SECT. III.

Of the Bandages belonging to the Præcordia *and Breaſts.*

The Bandage after taking off a Breaſt.

X. The Bandage to be applied after the Amputation of a Breaſt muſt be ſix Ells long, three or four Fingers broad, and rolled up with two Heads: You firſt fix its middle under the Axilla of the ſound Side A *Fig.* 1. *Tab.* XXXVIII, the two Heads are then croſſed upon the Shoulder at B, from whence its anterior Head deſcends obliquely a-croſs the Breaſt C, and its poſterior croſs the Back to the left Axilla D, (for we ſtill here ſuppoſe the left Breaſt amputated, or elſe only a large Scirrhus extirpated from it) where its Roller-heads are croſſed, and drawn tight upon the Compreſſes and Dreſſing on the Breaſt F E, from whence they aſcend again in the Direction C, and croſſing upon the right Shoulder B and Axilla A, then up again to B, ſo on ſeveral Times in the ſame Courſe as before, only obſerve to make your ſubſequent Croſſings of the Bandage rather upon the Dreſſings E F, than under the Axilla D, for the greater Firmneſs and Security. And, laſtly, when your Bandage is near ſpent, it muſt terminate by two or three circular Rounds about the Thorax, and upon the lower Part of the Dreſſings from A to D, faſtening its ends where they terminate by Pins or Suture.

XI. To retain the Dreſſings in moſt of the common Diſorders of the Breaſts, the double T Bandage of HELIODORUS (*Tab.* XXXVIII. *Fig.* 2.) is generally uſed; which conſiſts of two ſimple Bands or Slips of Linen, the one joined perpendicularly to the Center of the other in the Shape of a T, whence its Name. But its perpendicular Part is ſlit up almoſt to the end, which denominates its double, ſo that it forms a four-headed Bandage *a a* and *b b*, *Fig.* 11. or elſe two diſtinct Pieces may be ſewed on at ſome Diſtance from each other, as in *Fig.* 10. like the *Greek* Π. The tranſverſe Band *a a*, *Fig.* 10 and 11. ought to be long enough to tie round the Body, and about two or three Inches broad; the direct or perpendicular Part of the Bandage ought alſo to be long, and broad enough to retain the Dreſſings, and paſs over the Shoulders to tie behind the Back round the circular Band. The tranſverſe Part of the Bandage is applied round the Thorax at the bottom of the Breaſts, *Fig.* 2. *a a.* ſo as to tie with a knot upon the Back. After which the two ſlit ends of the Bandage are carried up over the Dreſſings *c*, and on each ſide of the Neck *d*, upon the two Shoulders *b b*. But there are ſome who apply the two Heads of the Bandage *b b* in a croſs manner over the Dreſſings, to retain them the more firmly, *i. e.* the right Head of the Bandage over the left Shoulder, and the left Head over the right Shoulder; in which Method they alſo apply the Bandage at *Fig.* 11. However, we find that the plain Method at *Fig.* 2. *c.* will very well anſwer the purpoſe of Retention, and, by paſſing the two Heads *b b* on each Side the Neck, they are prevented from ſliding to either Side off from the Shoulders, and then they may be alſo tied behind the Neck, without laying the Patient's Back naked, to faſten them to the lower Round of the Bandage; by which laſt Method a weak Patient might be greatly injured from the cold Air.

Bandage for a diſordered Breaſt.

XII. Conſidering the laſt mentioned Inconvenience of HELIODORUS's Bandage, and that it was but badly adapted for an ulcerated Cancer extending itſelf towards the Axilla; in the courſe of my Practice I endeavoured to contrive a kind of Sling with four Heads, more ſuitable and commodious for the purpoſe, which I have ſince found to anſwer the good Intentions which I firſt expected from it. The Length of this Bandage or Sling I made an Ell, or four Foot long, and about ſix Inches broad, leaving the ſpace of about a Foot in the middle in the Bandage unſlit or entire. The middle or entire Part of this Bandage, *Tab.* XXXVIII. *Fig.* 3. we applied to the Compreſſes and other Dreſſings upon the affected Breaſt, which we here ſuppoſe to be the left, the two upper Heads *b b* were then carried over the right Shoulder, and the lower *c c*, under the left Axilla towards the right Scapula on the Back, where they are now tied together by two knots a little beneath the Letter *d*; and this is the Bandage which I have found much more eaſy and commodious, both for the Surgeon and Patient, than that of HELIODORUS, which laſt often moleſts the Patient to no ſmall Degree, by fretting off the Skin about the Breaſts and Thorax. Upon ſome ſlight Occaſions may be uſed a Napkin or Handkerchief applied in this manner, which will anſwer the Purpoſe tolerably well, and with very little Trouble, in the manner we have directed for the Eyes, *Tab.* XXXVII. *Fig.* 11.

Slings for the Breaſts.

XIII. We come now to a Bandage, whoſe Uſe and Application is very extenſive and commodious, termed the *Napkin* and *Scapulary*; which is applicable in

The Napkin and Scapulary.

in moſt Accidents, Diſorders, and Operations inflicted on the Thorax, as Wounds, Ulcers, Fiſtulæ, Paracenteſis, *&c.* of the Breaſt, Fractures of the *Spina dorſi*, Sternum and Ribs, or Luxations of the laſt, *&c.* 'Tis compoſed of two Pieces of Linen, the firſt like a *Napkin*, of about an Ell long for Adults; but for fat People it may extend to an Ell and a half or more, and folded four or ſix times together, ſo as to be about the breadth of eight or ten Fingers, more or leſs according to particular Circumſtances, which is then to be cloſely applied round the Dreſſings upon the affected Parts, and its two Ends ſewed or pin'd together upon the Breaſt, when the Diſorder lies before, and upon the Back, when it is behind, as is ſhewn in *Tab.* III. *Fig.* 1. B. But to prevent this circular Band, or *Napkin*, from ſubſiding beneath the Part affected, and from off the Dreſſings, you muſt next proceed to apply the *Scapulary*, which is a ſlip of Linen about three Feet long, and four or ſix Finger's Breadth, with a long ſlit in its middle ſufficient to let through the Head, as in *Tab.* II. *Fig.* 9. its two Ends coming down, the one over the Breaſt, and the other upon the Back, till they reach the circular Band or *Napkin* before and behind, to which they are now faſtened by Pins or Suture, as in *Tab.* III. *Fig.* 1. BC. This laſt Part of the Bandage derives its Name *Scapulary*, from a great Part of it reſting on the *Scapulæ*, or Shoulder-blades. There are ſome, who prepare and apply this Slip of Linen for the Scapulary in a very different manner, ſlitting it up at one end almoſt to the middle, ſo as to make three Heads, the two anterior of which they place on each Side the Neck, and croſs them upon the Sternum in ſhape of an X, as in *Fig.* 4. *Tab.* XXXVIII. *f*, faſtening them to the Napkin on each Side of the Thorax, as before.

SECT. IV.

Of Bandages for the Sternum *and* Ribs.

The Quadriga.

XIV. In a Fracture of the Sternum, after the Reduction and Dreſſing with a Plaſter, Compreſſes and Splints of ſtiff Paſte-board, you may, upon occaſion, apply the Napkin and Scapulary Bandage before deſcribed; but the generality of Surgeons make uſe of a peculiar and ſtronger Bandage for this purpoſe, which they call the *Quadriga*, or *Cataphracta*, by which the Sternum and Thorax may be more cloſe and firmly bound up. 'Tis made with a Bandage or double-headed Roller, about ſix Ells long, and three or four Fingers breadth, applied in the following manner: Firſt, the middle of the Bandage is applied under either Axilla, ſuppoſe here the left, *Tab.* XXXVIII. *Fig.* 4. *a*, and its two Heads being carried upward, are croſſed upon the Shoulder *b*, from whence they deſcend, one a-croſs the Breaſt *c c*, and the other upon the Back, proceeding obliquely to the oppoſite Axilla *d*, under which being croſſed, they then riſe up, and croſs on the right Shoulder *e*, as before on the left, after which the anterior Roller-head deſcends again obliquely a-croſs the Breaſt to the left Axilla *a*, where it began; which two Courſes being compleated, the remainder of the Bandage is ſpent in the circular Turns *g*, about the lower Part of the Thorax, deſcending a little at each Turn, and decuſſating the Roller-heads of the Bandage each time, either in the anterior or poſterior Part of the Thorax, more firmly to inveſt the Sternum, in the manner ſhewn by *Fig.* 21 *d d*. *Tab.* XXXVII.

till

till the whole diſordered Part of the Thorax is thus inveſted. This ſame kind of Bandage may be alſo applied after the Amputation of a cancerous Breaſt; in which great Care muſt be taken, ſo to place and tighten the Bandage on the Dreſſings, as to compreſs the Veſſels, and prevent their Bleeding, which may be beſt effected by making the Roller-heads change Hands, and croſs each other upon the affected Breaſt, at every Round above the firſt.

XV. With regard to Fractures and Luxations of the *Ribs* and *Spina dorſi*, after they have been properly reduced, and ſecured by Compreſſes, dipt in warm *Sp. Vini*, and with thick Splints of Paſteboard, your Deligation may be compleated as at Sect. XII and XIII. preceding. Bandage for the Ribs and Spine.

CHAP. V.

Of Bandages proper to the Abdomen *and private Parts.*

I. THE moſt uſual Deligation for the Abdomen, after the Infliction of *Wounds*, or the Operations of *Gaſtroraphia*, *Paracenteſis*, &c. is, by our modern Surgeons at preſent made with the Napkin and Scapulary, deſcribed in Sect. XII. of the preceding Chapter, and exhibited in *Tab.* III. *Fig.* 1. B C. which Bandage is very equal to its Intentions, only the Scapulary muſt here be longer for the Abdomen than it was for the Thorax, as every one muſt imagine from the Make of the Body. The Napkin and Scapulary.

II. The Ancients, and even at preſent ſome of the Moderns, apply a ſimple Bandage in the above-mentioned Caſes of the Abdomen; which, being about ſix Ells long, four Fingers breadth, and rolled up either with one or two Heads, is then applied upon the upper Part of the Abdomen, and continued by two or three circular Turns about the ſame, after which it deſcends ſpirally, till the Parts affected and their Dreſſings are well covered and ſecured, and, after ſecuring its Termination either by Pins or Suture, you are then to faſten it to a Scapulary, to prevent its ſubſiding. The *Quadriga*, *Tab.* XXXVIII. *Fig.* 4. may be alſo applied with Advantage for Deligations in Diſorders of the Abdomen; with this Difference, that, after making the Turns *a*, *b*, *c*, *d*, *e*, *f*, the Courſe *g* muſt be continued either circularly, or ſpirally over the injured Parts of the Abdomen; ſo there is here no need of the Scapulary, ſince the circular Turns of the Bandage *g*, are ſuſtained by the Parts *a*, *d*. Circular Bandage of the Abdomen.

III. Longitudinal Wounds of the Abdomen, which are not very large, may uſually be ſucceſsfully united and healed without *Gaſtroraphia*, or the Suture, barely by the *uniting Bandage*, as we have declared in treating of Wounds in the Abdomen; which Bandage muſt be about four Ells long, and four Fingers breadth. In the middle of it is made a Slit about four Fingers breadth long, and the ends of the Bandage are then rolled up in two Heads, *Tab.* V. *Fig.* 8. And the method of applying it, I think, may be eaſily learned from what we have ſaid more at large on the uniting Bandage of the Forehead, Chap. II. Sect. IV. Tab. XXXVII. Fig. 3. For the Slit, or middle Part of the Bandage being laid over the Wound the other Head of the Roller is carried round the Abdomen, and then paſſed through the ſaid Slit, and drawing the two Heads tight, the Lips of the Wound are thereby approximated, or joined cloſe together, then the Uniting Bandage of the Abdomen.

Roller-heads, being carried back to the *Vertebræ* or Spine, are croſſed there, and brought round again to the Wound, where the two Heads decuſſate each other, to conſtringe and approximate the Lips; in which manner the Bandage is to be continued till it is ſpent, and then faſtened either by Pins or Suture.

Bandage for the Omphalocele.

IV. For the *Hernia umbilicalis*, take a leathern Belt armed with a Compreſs either round, (as in *Tab.* XXIV. *Fig.* 6. A.) or ſquare (as in *Tab.* XXXVIII. *Fig.* 5.) which Compreſs or Button is to be placed over the Navel, after a Reduction of the *Hernia*, and the Belt then faſtened round the Abdomen, either by the Strings BB, or the Buckle C. (*Tab.* XXIV. *Fig.* 6.) or otherwiſe. But leſt the Belt BB. *Tab.* XXXVIII. *Fig.* 5. ſhould ſubſide, or fall down lower than the Part affected, you muſt connect it both before and behind to the Scapulary C, made of ſtrong Linen, and to prevent it from ſliding upwards, a piece of Linen or Callico is to be faſtened under the Compreſs A, which, being brought round the Nates on each Side the Scrotum, is carried up, and faſtened to the Sides of the Belt BB, by Strings or otherwiſe.

The T Bandage for the Scrotum, &c.

V. For *Fiſtulæ* and Abſceſſes of the *Anus* and *Perinæum*, a Fracture of the *Os ſacrum*, a Luxation of the *Os coccyx*, after cutting for the Stone, &c. we generally apply the T Bandage of Heliodorus, as it is denominated from its Figure and Inventor; ſee *Tab.* II. *Fig. h.* and *Tab.* XXXVIII. *Fig.* 10 and 11. The proper Dreſſings being held upon the affected Parts, the tranſverſe end of the Bandage *a a*, *Fig.* 14. is applied round the Abdomen, with its perpendicular Part coming down upon the *Os ſacrum b*, and betwixt the Thighs *d d*, up to the circular or tranſverſe Part of the Bandage upon the Abdomen, to which tranſverſe Part they are faſtened by a knot on each Side near the Groins. This T Bandage is alſo convenient for the *Hydrocele*, *Sarcocele*, and other Tumours of the Scrotum and Groins, with Inflammations of the Teſticles, &c. where, however the tranſverſe Part of the Bandage *a a Fig.* 7, 8, 12. muſt be applied ſo as that the perpendicular Part *b b*, (*Fig.* 6, 7, 8, 9, 10, 11, 12.) may inveſt and retain the Dreſſings upon the Parts affected. In many Caſes it will be neceſſary to uſe the Scapulary without the Napkin, for the greater Firmneſs and Security of this Bandage. And, laſtly, you may obſerve, that the Figure of the T Bandage varies according to particular Uſes: That of *Fig.* 6 is adapted for the Inguen, as at *Fig.* 7. That of *Fig.* 9 is accommodated to the Scrotum, as in *Fig.* 1. That at *Fig.* 10 and 11. is fitted for Diſorder of the Breaſts, Anus, Scrotum, and Perinæum; and that at *Fig.* 13. is reſtrained chiefly to Tumours of the Scrotum, as the *Sarcocele*, *Hydrocele*, &c. being therefore termed the *Bourſe*, or Sacculus for the Scrotum.

Arnaud's Bandage for the Anus.

VI. We are furniſhed with a new kind of Bandage contrived purpoſely by Monſieur Arnaud of *Paris*, for *Fiſtulæ* and Abſceſſes of the Anus, which M. Garengeot [a] thinks to be admirably well adapted for thoſe Uſes, and deſcribes its Application in the following manner: Firſt, a Scapulary (*Tab.* III. *Fig.* 1. *c.*) long enough to reach the Abdomen, is applied with the Napkin B about the Body, as we before directed in Chap. IV. Sect. XII. then three or four Strings of Tape are ſewed near the Juncture of the Napkin and Scapulary with each other upon the Back, *i. e.* in the Interſtice *a a*, *Fig.* 14. *Tab.* XXXVIII. He

[a] In his Chapter on *Abſceſſes of the Anus*; but in the ſecond Edition of his Operations he ſays nothing of its Inventor.

then

then takes another Band above an Ell long, and five or ſix Fingers breadth, which he ſlits up in a right Line, ſo as to leave not above two Hands breadth entire at one end, like the Part *b* in the laſt mentioned Figure: Again, there are three or four more Strings or Tapes faſtened at the Margin of the Part *c c*, which are to tie with the other Strings of the Napkin in *a a*, by ſingle Knots, by drawing which, he ſays, the Patient may take off and renew the Bandage at pleaſure without any manner of Trouble or Uneaſineſs. [a]. When the Fiſtula has been dreſſed with Tents, Lint, and Compreſſes, the fore-mentioned Strings at the Ends of the Bandage, are to be tied with each other in Knots upon the Back at *a a* and *c c*; which done, the two ſlit Ends *d d* are paſſed over the Anus betwixt the Thighs, ſo as to riſe up and join with the Napkin, the one on the right Side of the Abdomen, and the other on the left. And, laſtly, if there be a profuſe Bleeding after the Inciſion, as is ſometimes the Caſe, an Aſſiſtant is then forcibly to compreſs the Parts with his Hand for an Hour or two. The Excellency of this Bandage, according to M. GARENGEOT, conſiſts in its being held firm, and cloſely compreſſing the affected Parts by means of the Scapulary upon the Shoulders, which is the Fulcrum of the Bandage. But I alſo think the common T Bandage, *Fig.* 11. has the ſame Advantages, provided the Scapulary be made ſtrong; and eſpecially if the whole Bandage, or at leaſt its tranſverſe Part be made of Ticking for Strength.

The knotted Bandage for the Perinæum.

VII. There are few or none of the preceding Bandages capable of reſtraining a profuſe Hæmorrhage after cutting for the Fiſtula of the *Anus*, or for the Stone; and finding none propoſed for theſe Purpoſes by Writers in their Books of Surgery and Bandages, notwithſtanding the Inſtances of Patients loſt by ſuch profuſe Bleeding after thoſe Operations; I therefore thought it would be of ſome Conſequence to contrive one more effectual for ſuch Purpoſes, than any we are yet acquainted with, which, in my Opinion, proves to be the following. Take a Bandage or ſlip of Linen ſix Ells long, and three Finger's Breadth, rolled up with two Heads; and after the Wound has been dreſſed with Doſſils of Lint, and thick Compreſſes dipt in *Alcohol Vini*, as in other Hæmorrhages, apply the middle of your Roller over the Perinæum, from thence bringing up its anterior Head through the left Inguen (*a b Tab.* XXXVIII. *Fig.* 15.) a-croſs the correſponding *Os ileum b*, and the poſterior Roller-head aſcending betwixt the Nates of the ſame Place, the Heads are then drawn tight, croſſed or decuſſated, and then carried the anterior Head forward a-croſs the Abdomen *d*, and the poſterior directly a-croſs the Back or Loins to the right *Ileum e*, where, decuſſating each other, the anterior Head is brought down over the right Inguen *f*, *g*, and the poſterior deſcends over the right Buttock to the Perinæum, where the two Roller-heads decuſſate each other, and change Hands ſo as to form a kind of Knot, in the ſame manner as the knotted Bandage for Arteriotomy in the Temples (*Tab.* XXXVII. *Fig.* 7.) The Roller-heads being thus contorted, and drawn tight, do then again aſcend, the one over the left Inguen *a*, *b*; and the other betwixt the Nates to *c*, continuing in the ſame Courſe as before, always obſerving to fix your Knots or Decuſſations between the Thighs

[a] But what is to be done with the two narrow Ends of the ſlit Bandage, M. GARENGEOT does not tell us, though without doubt they muſt be joined with the anterior Part of the Napkin, like the T Bandage, or elſe the Strings would be of no Uſe.

behind, and advancing upon the Inciſion of the Perinæum in cutting for the Stone, and upon the Anus after Syringotomy, or cutting the Fiſtula. And this is the propoſed Bandage, which may be called knotted for the Perinæum, as it very cloſely inveſts and compreſſes that Part. If it be thought neceſſary to make the Bandage ſtill ſtricter upon the Parts, after the firſt Round or Courſe over each Inguen, as before, and drawing the Knot tight upon the Perinæum, the anterior Roller-head may be carried up obliquely from the left Inguen *a*, over the Abdomen and right Shoulder in the Courſe of the dotted Line *b*, and the poſterior Head being carried up a-croſs the Back to the ſame Shoulder, the two Heads are there croſſed or decuſſated, and then brought down again in the ſame Courſe to the Perinæum, where they are to form a Knot as before, the better to compreſs the bleeding Veſſels; after which they are carried up in the ſame manner from the right Inguen *g*, *d*, *i*, to the left Shoulder, there decuſſated, brought down, and formed in a knot on the Perinæum, as before. And, laſtly, thoſe Turns which only aſcend from the Perinæum to the Hips, are to be continued circularly about the Body, as long as the Bandage laſts, for the greater Firmneſs and Security of the whole: But when you croſs it over the Shoulders, in the laſt deſcribed Method, your Roller ought to be at leaſt eight Ells long, to allow for thoſe large Turns.

Spica Inguinalis.

VIII. We have a particular Kind of Bandage, termed *Spica inguinalis*, which is applied after inteſtinal Ruptures, the Operation for the *Boubonocele incarcerata*, a Luxation of the Femur, and a Fracture of the *Os ileum*. This may be applied after ſeveral Methods like the Spica for the Shoulder before deſcribed, and, like that, it may be made either with a ſingle or double-headed Roller. The ſingle-headed Roller muſt be four Ells long, and three Fingers breadth, its End being fixed upon the *Ileum* of the ſound Side, (*Tab.* XXXVIII. *Fig.* 16. *a*) the Roller-head is paſſed round the bottom of the Abdomen *b b*, and from the other Hip *c*, it paſſes round the Back part of the Thigh, comes up between the Thighs at *d*, and paſſes over the Compreſs on the Inguen *e*, and from the Hip *c*, after croſſing it goes round the Back to its beginning at *a*, which Courſe is to be again repeated as long as the Bandage will permit, or the Surgeon ſhall ſee neceſſary; or after the firſt Courſe has been thrice repeated, the remainder may be ſpent circularly about the Abdomen, to bind down and ſecure the others. But after the Operation has been performed for the *Hernia incarcerata*, when you have thrice repeated the firſt Courſe, you may then faſten the Bandage with a Pin in the left Inguen, and bringing it up under the Scrotum *f*, over the right Inguen *g*, you may faſten it in the ſame manner to the circular Rounds at *h*, and, making it deſcend again from *h* under the Scrotum *f*, it may be brought up again to the left Inguen *d e*, and there pinned as before, which Courſe may be repeated at Diſcretion, in order to retain the Dreſſings. When this Bandage is thus applied but to one Side, it is termed the *Spica inguinalis ſimplex*.

Simple Spica with a two headed Roller.

Second Method.

IX. The ſimple *Spica inguinalis* may be alſo commodiouſly applied with a two-headed Roller, about five Ells long, and three Fingers broad, the middle of which is to be fixed, like the former, upon the right Hip *a*, *Fig.* 16. and the two Heads brought round to the other Hip *c*, where, being croſſed, they are then carried down to the Perinæum *d*, where they are croſſed again, and then brought up to the Hip *c*, thence round the Body to the other Hip *a*, and ſo on

on till the Roller terminates. Or you may apply this double-headed Roller, by fixing its middle in the Perinæum at *d*, from whence bring up the two Heads obliquely to the Hip *c*, they there croſs, and paſs round the Body to the other Hip *a*, repeating the ſame Courſe till the Bandage is ſpent, when its Extremity may be faſtened where it terminates by a Pin. Third Method.

X. When the *Spica* Bandage is thus applied on each Side for a Diſorder in both the Groins, it is then termed the *double Spica inguinalis*, for which the Roller muſt be ſix Ells long, three Fingers broad, and rolled up with two Heads. The middle of the Bandage is here uſually applied to the Back upon the Loins, and coming round the Body to the anterior Part of the Abdomen, the Heads are there croſſed, and, deſcending on each Side the Scrotum, they go backward and round each of the Nates to the adjacent Inguen on each Side, over which deſcending upon the Dreſſings, they then proceed backwards and upwards to their Origin at the Loins, where the Heads being croſſed, are then brought round, and deſcending over each Inguen, the preceding Courſe is repeated as before, and ſo on till the Bandage being ſpent, its End is faſtened where it terminates. You may alſo obſerve, that this Bandage may be applied in the Courſe, which we deſcribed in Sect. VII. Suppoſing you omit the knots, or croſſing upon the Perinæum; that is, applying the middle of the Bandage between the Thighs (*Tab.* XXXVIII. *Fig.* 15. *a.*) the two Heads aſcend in the Direction *b*, to the Hip *c*, where, croſſing, they then go round the Body to the other Hip *e*, and from thence down by *f*, *g*, under the Perinæum, where the Roller-heads change Hands, or croſs, and return in the ſame Courſe *f*, *g*, to the Hip *e*, and from thence round the Body to the other Hip *c*, and then over the left Inguen to its Origin at the Perinæum, which Courſe muſt be repeated till the Bandage is ſpent, and its end faſtened where it terminates. The *double Spica inguinalis* may be uſed for a Luxation of both the Thigh-bones, or in a Fracture of their Necks, as alſo after the Operation for Ruptures on both Sides. Double Spica Inguinalis.

XI. The common Bandage for Bubo's, and other Tumours in the Groins, is uſually the T Bandage of HELIODORUS, deſcribed at Sect. V. preceding; or the Bandage at *Fig.* 6. *Tab.* XXXVIII. applied like the T Bandage. But as one of its tranſverſe Heads *a a* is ſhort, it muſt be placed ſo upon the Body as to tie on one ſide, as in *Fig.* 7. *c*, that the Patient may unlooſe, and faſten the ſame at pleaſure. The largeſt, and perpendicular Part *b*, deſcends over the Groin, under the Perinæum, and over the Buttock, to the Back-part of the tranſverſe end *a a*, upon the Loins on one Side. We have in the Table now mentioned only repreſented this Bandage for one, *viz.* the left Inguen; but the very ſame being turned on the other ſide, will alſo ſerve for the right Inguen, upon which it muſt be applied as before on the left. Bandage for Bubos.

XII. The Application of Bandages to the Scrotum is very frequent, not only to retain Cataplaſms, and other topical Remedies for an Inflammation, *&c.* of this Part, or of the Teſtes, but alſo for the crural Rupture, where a juſt Adminiſtration hereof proves the chief Remedy. There are three Kinds of Bandage applied by Surgeons to this Part, the firſt, and moſt handy of which is the T Bandage of HELIODORUS before deſcribed at Sect. V. having the upper end of its perpendicular Part of about two Hands breadth, and perforated, to traſmit the Penis, as in *Tab.* XXXVIII. *Fig.* 9. *c.* the Extremity being ſlit Bandages for the Scrotum. First.

up

up for about two Spans, ſo as to make the two Heads *b b*. After the tranſverſe Part *a a* has been applied round the Body, the Penis then tranſmitted through the Aperture *c*, and the two Slips *b b* decuſſating each other upon the Perinæum, the Scrotum and its Dreſſings are, by that means, pretty cloſely inveſted and well retained, ſuppoſing the two Slips *b b* to be faſtened upon the Hip on each Side, as at *Fig.* 8. *c*. Sometimes the Scrotum is inveſted (2.) with a kind of Sling with four Heads, about an Ell long, and ſix Fingers broad, ſlit up at each End, ſo as to leave about two Hands breadth entire in its middle; which may be conveniently enough applied to retain Compreſſes and other Remedies to this Part. 'Tis applied by fixing its entire or middle Part upon the Scrotum, and, betwixt its two anterior Heads, which come upon the ſound Parts, you let through the Penis, and, carrying the Heads round the Body, tie them in a knot upon the Loins: while the two inferior or poſterior Heads are paſſed under the Perinæum, and, croſſing each other, are brought forwards over the Nates, that of the right ſide to the left Inguen, and that of the left to the right Inguen, as in *Fig.* 12. tying them in a knot. Notwithſtanding the two now mentioned Bandages, are very ſufficient and convenient for moſt Dreſſings and Diſorders of the Scrotum, we are yet provided with another, which is by the *French* denominated *la Bourſe*, or the Purſe, from its Reſemblance to that receptacle; concerning which we have already ſpoke at Sect. V. preceding. 'Tis to be made of ſtrong Linen, with four Heads, and ſuitable Strings, as in *Tab.* XXXVIII. *Fig.* 13. where A A denote the Purſe for the Scrotum, B B the two Swaths, which, being placed round the Body, are tied together by the Strings *a b*. The Aperture *c* tranſmits the Penis, and the two lower Heads of the Bandage D D are carried betwixt the Thighs, ſo as to paſs round the Nates, and be faſtened by the Strings E E upon each Hip, by paſſing them through the eylet Holes *d d*, by which Means they become duly faſtened to the upper Part of the Bandage B B. This laſt Bandage is alſo generally denominated the Suſpenſor of the Scrotum.

Second. (2.)

XIII. The ſeveral Swaths and Bandages for Ruptures, you may ſee figured and deſcribed at *Tab.* XXV. foregoing.

Bandage for the Penis.

XIV. The little Bandage to be applied upon the Penis in Caſe of Wounds, Abſceſſes, Phlebotomy, a Phimoſis, and other Diſorders of that Part, muſt be about an Ell long, and an Inch broad; having a Slit or Aperture at one end, of an Inch long, and its other End ſlit up for about two Hands breadth; ſee *Tab.* II. *Fig. e*. 'Tis apply'd by paſſing the ſlit end through the Aperture in the other, ſo as to form a Loop or Nooſe, which is drawn tight upon the Penis and its Dreſſings; and, after winding round the remainder of the Bandage moderately tight upon the affected Parts, till you come to the Slit-ends; theſe laſt are alſo to be paſſed once or twice round in oppoſite Directions, and then faſtened by tying in a knot. For Abſceſſes, and other Diſorders of the *Glans* and *Præputium*, it is moſt convenient to apply a Compreſs and Plaſter, cut in the Shape of a *Malta* Croſs, making a ſmall Aperture in their middle for emitting the Urine; theſe being ſizeable to the Part, and the other Dreſſings they are to retain, ſhould be firſt applied before the preceding Bandage, by which they are to be ſecured. And, laſtly, in Caſe of a preternatural Rigidity and Inflammation of the Penis, which often happen in a Priapiſm, Paraphimoſis, and Gonorrhea, it may not be amiſs to follow the Direction of thoſe, who adviſe

viſe the Penis to be placed in a kind of oblong Linen-bag, anſwerable in Size and Figure to the Part, upon which it may be retained by two long Strings, faſtened about the Waiſt, or upon the Groins.

CHAP. VI.

Of Bandages for the Arm *and* Hand.

Bandage for a fractured *Humerus*.

I. WE have hitherto deſcribed the Bandages proper to the Trunk in its ſeveral Diſtricts of the Head, Neck, Thorax, and Abdomen; we ſhall now therefore treat of thoſe belonging to the Limbs and Extremities of the Body; whether upper or lower, beginning with that for a Fracture of the *Os Humeri*. When the Fracture has been properly reduced, and ſecured with a large Compreſs (*Tab.* II. *Fig.* 18.) expreſſed out of warm Wine or *Oxycrate*, your Bandage, to be then applied, muſt be about ſix Ells long, three Fingers broad, and rolled up with one Head, which is to begin by two or three circular Rounds upon the fractured Part, and then gradually to aſcend in ſpiral Revolutions or Doloires to the Shoulder, and, after making a Courſe about the Thorax, and under the ſound Axilla (which is often omitted) the Roller returns to the affected Shoulder, and, gradually deſcending by Doloires in the like ſpiral Courſe, it at length forms three circular Rounds again upon the Fracture itſelf. Before the Roller is applied, it ſhould be moiſtened with warm Wine, its Spirit, or *Oxycrate*, in order to make it adhere the more firmly upon the Part. The Bandage at laſt deſcending to the bottom of the Humerus in a ſpiral Courſe, it then forms two or three ſpiral Turns upon the upper Part of the Cubitus below its Flexure, but ſo as to leave the *Olecranon*, or Elbow, diſengaged, and free for Motion, by which Courſe the Bandage will adhere more firmly to the Part. This done, in the next Place, you lay four Compreſſes longitudinally, according to the Courſe of the Arm, which are to be about ſix or eight Fingers breadth long, and two broad, diſpoſed upon the Fracture equidiſtantly, and previouſly moiſtened with a little warm Wine, or *Oxycrate*; then the remaining Part of your Bandage is carried up ſpirally over the Compreſſes from the Cubitus to the Fracture of the Humerus, where, making two or three circular Rounds, it then aſcends ſpirally to the Shoulder; and if any Part of the Roller ſtill remains after the Compreſſes have been well covered, it again deſcends by ſpiral, but more diſtant Turns upon the Arm, till at laſt its End is faſtened, where it terminates by a Pin. In the next Place, the Surgeon generally applies three or four Splints [a] of about a Span long, and two Fingers broad, made commonly of ſtiff Paſteboard, or Slips of thin Deal glued on Leather, but ſometimes of thin Steel or Braſs, which are applied longitudinally like the Compreſſes, according to the Length of the fractured Arm, as at *a a a*, *Fig.* 17. *Tab.* XXXVIII. which Splints are again retained by three Tapes of a-

[a] There are indeed ſome (as M. PETIT Lib, *de Morb. Oſſ.* Tom. II. pag. 34.) who reject the Splints as uſeleſs in Fractures, judging the Compreſſes alone to be very ſufficient, as I am ſenſible they often are; but the generality of Surgeons have notwithſtanding retained the Uſe of Splints, for the greater Firmneſs and Security of the reduced Fracture.

bout

bout two Feet, or half an Ell long, tied firmly upon the Part, beginning with the middle one firſt, before you tie on either of thoſe at the Ends; always obſerving to make your Knots even, and upon the external Part of the Arm, for the greater Neatneſs and Conveniency of tying, and untying them; ſee *Tab.* XXXVIII. *Fig.* 17. *bbb.*

Treatment after the Deligation.

When the Deligation has been in this manner compleated, the Arm is then to be ſuſpended in a Sling or Scarf about the Neck in an angular or bent Poſture, ſo that the Hand may come over the *Scrobiculum cordis* [a]. In an oblique Fracture of the Humerus it may be convenient, to let the Weight of the Arm be leſs ſupported by this Sling, in order to prevent the lower Fragment from riding over, or above the upper one; but in a tranſverſe Fracture the Sling ſhould be ſhorter. The Sling for this Uſe may be commodiouſly made of a large Napkin folded together, ſo that being tied about the Neck by its two Corners in the Knot *d*, upon the ſound Shoulder, the Arm may be ſuſtained by the middle of it *cccc*. When the Patient's Circumſtances are anſwerable, this Sling may be made of black Silk inſtead of a Napkin. Inſtead of one long Roller for the Fracture of the Humerus, there are ſome Surgeons, who uſe three ſhorter ones, of which they make the firſt an Ell and an half, the ſecond two Ells, and the third two Ells and an half long; the firſt is ſpent in aſcending Turns, the ſecond in deſcending ones, and the laſt is employed upon the Compreſſes and the Fracture itſelf; which is a Practice that will very well anſwer the End for which it is deſigned by the Operator. Some again apply the Splints immediately upon the Compreſſes, and ſpend the third Bandage, or the laſt Part of the long Roller in retaining them upon the Part, which is a Method, in my Opinion, equally good with the firſt. It is to be obſerved as a Caution, that, without ſome extraordinary Accident, you ſhould never take off the firſt or outermoſt Bandage before the fourth or fifth Day, when it is well adapted; nor the ſecond, before the eighth Day, nor the third, or innermoſt, before the twelfth Day, when the Fragments of the Bone may be ſuppoſed firmly conjoined; the firm Union of which we generally find by Experience accompliſhed in this Bone, within the Space of forty Days from its Reduction.

How to prevent an Anchyloſis.

After the Renewal of the third Bandage, the Arm is to be moved a little, or gently bent, and extended a little at the Juncture of the Elbow, in order to prevent an *Anchyloſis*, or Stiffneſs of the Joint. If the Limb ſhould have already contracted ſome Degree of this Diſorder, the beſt Method of reſtoring its Mobility is, by frequent Motion of the Joint, with the Application of emollient Ointments, Fomentations, or Cataplaſms, as alſo to let the Patient ſwing around a Weight every Day in his Hand. 'Tis alſo of no ſmall Service in this Diſorder, to thruſt and continue the Arm for ſome time in the Belly of an Animal juſt killed; but for the Uſe of Spirits and Aſtringents in this Caſe, which are ſometimes ordered by imprudent Surgeons, they are highly pernicious.

When the Fracture is near the *Humerus*.

When the *Os humeri* is fractured in its Neck, or near the Shoulder, the Patient is then in a dangerous Caſe, and the preceding Bandage will very often be of little or no Service. It may therefore here be proper to apply the ſimple

[a] This Celsus, Lib. 8. has long ago taught: That a Sling is to be made about the Neck with a Napkin folded together, into which the Arm is to be placed as at *Fig.* 17.

Spica,

Spica, which we before recommended for a Fracture of the Clavicle in Chap. IV. Sect. II. preceding; only obſerving, in this Caſe, to make the Deligation, or Turns of the Bandage about the Shoulder, more exact and firm, as being the Part here immediately concerned. M. PETIT alſo thinks, that the eighteen-headed Bandage, *Tab.* IX. *Fig.* 4. may be properly uſed for this Fracture; but I cannot ſee how that Bandage will be ſufficient to retain the fractured Parts.

Bandage for a fractured *Cubitus*.

II. For a Fracture of the lower Arm or *Cubitus*, after a Reduction of the Bones according to our Directions given for Fractures, you are, in the firſt Place, to apply a Piece of Linen-cloth of a Span's length and a Hand's breadth, ſlit on each ſide as we deſcribed for a Fracture of the *Humerus*, *Tab.* II. *Fig.* 18. which, being dipt in *Sp. Vini*, or *Oxycrate*, its Heads, or ſlit Parts, are to be cloſely applied round the Fracture. Then you are to take two thick Compreſſes, almoſt the Length of the *Ulna*, and apply one on the inſide, and the other on the outſide of the Cubitus, over which again you muſt fix Splints of Wood or Paſteboard of a convenient Size; though M. PETIT thinks the Uſe of ſplints unneceſſary here. For your Bandage, that muſt be a ſingle-headed Roller of about an Ell and half long, and three Fingers broad, which is to inveſt the ſplints, or Compreſſes without the ſplints, firſt, by making two or three circular Rounds upon the Fracture, and then aſcending by ſpiral Doloires or Turns above the Cubitus and Elbow, where two or three circular Rounds muſt be made before the Band terminates; then you take another Band, and, faſtening it by two or three circular Turns upon Termination of the former, it then gradually deſcends by ſpiral Turns to the Hand, and, taking in the Thumb by it as in a Loop, you draw it back, or extend it towards the Carpus, upon which, after two or three circular Turns, its End is faſtened by a Pin. Then you are to place two ſplints of thick Paſteboard, the one without, and the other within-ſide the Cubitus, which ſplints muſt be almoſt as long as the *Ulna*, and broad enough to inveſt the Part, dipping them firſt in Spirit of Wine, or *Oxycrate*, to render them pliable, and to ſit cloſe to the Limb, upon which they are to be retained by a Bandage two Ells long, and near three Fingers broad, to be applied firſt by making two or three circular Rounds about the middle of the Cubitus, and then aſcending ſpirally to the Elbow; then deſcending in the ſame manner, and faſtening the End where it terminates by a Pin or Suture. Though there is no great Obſtacle againſt your retaining the ſplints by three or four Tapes, as we have repreſented in *Tab.* XXXVIII. *Fig.* 17. *bbb* for the *Humerus*. And there are ſome Surgeons, who uſe but one Paſteboard Splint, in which they place the Arm as in a Trough; ſee the Figure of it in *Tab.* VIII. *Fig.* 14. the Method of applying it is in *Tab.* XXXVIII. *Fig.* 17. *ee*. When every thing has been adapted in this manner, the Arm is to be conſtantly ſuſpended in a Napkin or Sling about the Neck, denoted by *cccc* in the laſt cited Figure. For the reſt, you may obſerve what has been ſaid at Sect. II. *& ſeq.* for a Fracture of the Humerus; and thus a Fracture of the Cubitus, or lower Arm, will uſually obtain a perfect Cure within the ſpace of a Month or thirty Days.

Bandage for a Fracture of the Carpus.

III. For a Fracture of any of the Bones in the Carpus, after the Fragments have been adequately reduced, the following Bandage is to be applied. Firſt, you take a ſingle-headed Roller five or ſix Ells long, and two Fingers broad,

with which you make three circular Rounds about the injured Carpus, paſſing it ſoon after betwixt the Thumb and Fore-finger, and then roll it thrice round the Carpus again, ſo as to make the Bandage interſect itſelf upon the Back of the Hand like an X. This done, the Roller-head is then carried up ſpirally from the Carpus towards the Cubitus, and at laſt paſſes above the Juncture of the Elbow; then, after fixing a Compreſs on the out and inſide of the Carpus correſponding to its breadth, the Bandage deſcends again ſpirally to the Hand, in order to make an exact Retention of the Compreſſes. Laſtly, over the Compreſſes are placed two Paſteboard Splints, which are bound on very exactly by the remainder of the Bandage; and the Arm is then ſuſpended in a Sling or Napkin about the Neck, as at *Fig.* 17.

Bandage for the Metacarpus.

IV. When the fractured Parts of any of the metacarpal Bones have been adequately reduced, the Bandage before ordered for the Carpus, is to be applied by making, firſt, three circular Rounds about the injured Part of the Hand, and then, paſſing it betwixt the Thumb and Fore-finger round the Ball of the former, it is then carried round the Carpus, after which it returns to its former Courſe about the Metacarpus, by croſſing over the Back of the Hand like an X; and when this Courſe has been thrice repeated, and the Bandage carried a few times round the Metacarpus, it then gradually aſcends by ſpiral Turns above the Cubitus, or Elbow, as we ſaid before at Sect. VI. And, laſtly, two Compreſſes and Paſteboard Splints are placed, the one on the Palm, and the other on the Back of the Hand, in which Poſition they are cloſely retained by the remainder of the Bandage. See the Figure of the Splint in *Tab.* XXXVI. *Fig.* 5.

Bandage for a Luxation of the Cubitus.

V. For a Diſlocation of the Cubitus, after an adequate Reduction, as we have directed in our Book of Luxations, a Linen-cloth cut, as in *Tab.* II. *Fig.* 8. is to be firſt dipt in *Sp. Vini*, or *Oxycrate*, and then exactly applied round the Elbow, or Juncture of the Cubitus. You then take a ſingle-headed Roller about five Ells long, and two Fingers broad, with which you make two circular Rounds above the Flexure of the Cubit, from thence deſcending obliquely acroſs its Flexure, as in the Bandage after Bleeding; it then forms two circular Rounds upon the Cubit below the Elbow; and, aſcending again obliquely over the Flexure, and up by the inſide of the Arm, it, by that means, croſſes the former Courſe in ſhape of an X, and, having made two more circular Rounds about the lower Head of the Humerus, it is then carried down below the Elbow; ſo that the Bandage forms a ſort of Figure of 8, the one half above, and the other half below the Elbow. There are indeed ſome Surgeons, who think this long and complicated Bandage unneceſſary for a Luxation of the Elbow, as the Intention may be as effectually anſwered by a ſimple ſpiral Bandage continued up and down the Arm, moiſtening the Roller with ſome of the fore mentioned Liquors, to ſuppreſs or prevent a Tumour and Inflammation of the Parts. And, laſtly, the Arm, being thus dreſſed, is to be ſuſpended by a Sling about the Neck, as before; but then Care ſhould be now and then taken gently to bend and extend the Arm, to prevent a Stiffneſs of the Joint.

Bandage for a Luxation of the Carpus.

VI. For a Luxation of the Carpus, after Extenſion and Reduction, you take the preceding Bandage, and, paſſing it thrice round the affected Part, it is then carried betwixt the Thumb and Fore-finger, going backward round the Ball of the Thumb, and croſſing the former Turn on the Back of the Hand like an X, and

and then it passes circularly about the Carpus. This Course, being several times repeated, you are then to bind a stiff Pasteboard Splint on the fore and back Part of the Carpus, and a large Ball is to be placed in the Hand, in order to extend the Fingers; all which are to be properly secured by the rest of the Bandage, which is at last to terminate by spiral Turns above the Cubitus, to prevent Tumour and Inflammation.

Bandage for blaeding in the Arm.

VII. Among other Bandages of the Arm, we shall here briefly describe that for compressing the Orifice of an incised Vein, after bleeding in this Part. This is to be about an Ell, or Ell and half long, and near two Fingers broad; and is, in my Opinion, best applied by fixing its End upon the square Compress, covering the Orifice so as to let about a Span of it hang down above the outside of the Flexure of the Cubitus, and carrying the other Part of your Bandage from the Compress obliquely down, and over the inner side of the Arm, and making a Round below the Flexure of the Elbow, it then ascends again obliquely from the outside over the Compress, and round above the Elbow like a Figure of 8, the X or crossing, coming in the middle of the Flexure of the Arm. This last Course of the Figure of 8 you are to repeat as long as the Bandage will permit, saving enough to tie with the other End in a knot above the Elbow on the outside of the Cubitus, as in *Tab.* III. *Fig.* 1. D. If little Strings of a Span long are fastened to each End of this Bandage, as we frequently do in *Germany*, it may then be very neatly applied, as those Strings make but a very small knot, and then the broad Part of the Bandage need not exceed an Ell in length, and its Application may be performed exactly in the same manner.

Bandage for a Puncture of the Artery in Bleeding.

VIII. If the Surgeon should either, by accident or imprudence, have incised the Artery in opening the Vein of the Arm, after letting the Patient bleed *ad deliquium*; (see Part II. Sect. I. Chap. XII.) he must apply two or three thick Compresses, in one of which must be included a Farthing or Halfpenny, to make the greater Pressure and Resistance upon the wounded Artery. Then you must take a single-headed Roller, five or six Ells long, and two Fingers broad, and making first two or three Rounds above the Elbow, you then conduct the Roller as after Phlebotomy at Sect. VII. but drawing the Bandage a little tighter here for the Artery, than for the Vein; and, after five or six Rounds about the Arm and Elbow in that manner like a Figure of 8, apply a long and narrow Compress, extending on the inside of the Arm from the Flexure of the Cubitus to the Axilla, so as to be incumbent as exactly as possible upon the Brachial Artery; your Roller must then ascend gradually by pretty tight spiral Rounds upon the Arm up to the top of the Shoulder, in order to stop and diminish the Quantity of Blood coming to the Wound by that Trunk of the Artery; which done, your Roller then is carried obliquely from that Shoulder a-cross the Breast, and under the opposite Axilla, and, coming round again to the Shoulder of the injured Arm, it then descends spirally upon the Arm in an opposite Course to the preceding, fastening the End of your Roller securely wherever it terminates. If a Bandage of the forementioned Length is not at hand, any one that you have, which is shorter, may be fastened about the Wound, and the brachial Artery, which may even be held and compressed by the Fingers of an Assistant, till you can procure a longer Bandage; for to delay any considerable Time in providing a longer Bandage without this Precaution, would expose the Patient to a dangerous Hæmorrhage, and

more fatal Symptoms. For nothing can hinder you from applying your long Bandage over the ſhorter, with the neceſſary Compreſſes, as we have now directed, when you have them in Readineſs. When the Deligation is compleated, the Arm is to be ſuſpended in a Sling about the Neck, as in *Tab.* XXXVIII. *Fig.* 17. but without the Paſteboard Caſe *e e*; in the mean Time the Patient muſt be ordered to abſtain from Commotions both of Body and Mind, and alſo to refrain from an heating Diet, and ſpirituous or fermented Liquors, and, for the reſt, you may conſult our Chapter profeſſedly on the Accident before-cited.

Bandage for an Aneuriſm.

IX. Nor is the preceding Bandage confined to Punctures of the Artery only, but it may be alſo applied with equal Advantage for ſmall Aneuriſms, which do not require the Operation with a Scalpel and Tourniquet; in which Caſe the firſt Step is to return the extravaſated Blood again into the Artery, by Preſſure with the Finger or T[illegible]mb, after which you muſt apply over the Part that was diſtended, firſt, a bit of aſtringent Plaſter, and then a thick Compreſs with a bit of Money folded in it, as in the preceding; which Plaſter and Compreſs muſt be ſizeable [illegible] the Aneuriſm, or Tumour; over the firſt Compreſs, including the Money, you are to apply ſeveral others, according as the Caſe may require, and retain the whole, by cloſely adapting the Bandage deſcribed in the preceding Paragraph, which Dreſſing is to be conſtantly wore for a conſiderable Time upon the Part; ſee an Example or two deſcribed by HILDANUS, *Cent.* III. Obſ. 43, 44.

Bandage for Phlebotomy in the Hand.

X. After bleeding, or opening a Vein in the Hand, particularly in the *Salvatella*, as 'tis commonly called, you fix two ſmall Compreſſes on the Orifice, and, with a broad piece of Tape upwards of an Ell long, you make two circular Rounds about the Carpus, thence guiding it over the back of the Hand, it paſſes betwixt the Ring and little Finger, then back again betwixt the firſt and middle Finger to the other Side of the Carpus, croſſing the former like an X upon the Compreſs and Back of the Hand, which Courſe, round the Ring-finger and Carpus, being thrice repeated, the Bandage terminates by as many circular rounds about the laſt, upon which its End is faſtened.

Bandage for a burnt Hand.

XI. After the Uſe of Medicines proper for Burns or Scalds, you then take a piece of Tape ſix Ells long, and an Inch broad, rolled up with one Head. With this you make two circular Rounds about the Carpus, from whence it is carried a-croſs the Palm of the Hand to the little Finger (*Tab.* XXXVIII. *Fig.* 18. *a.*) which is the firſt inveſted therewith by ſpiral aſcending, and then deſcending Turns down to its Root at the Hand, from whence it paſſes to the Ring-finger *b*, which it inveſts, in the ſame Manner, then to the Middle-finger *c*, and the Index *d*, from the bottom of which laſt it paſſes by the circular Turns *e e e*, about the Metacarpus betwixt the Thumb and Fore-finger, then it inveſts the Thumb, *f*, in like manner as it did the Fingers, and from the bottom of the Thumb it is carried on ſpirally upon the remainder of the Metacarpus by the Rounds *g g*, the Fillet itſelf terminating at laſt circularly as it began, upon the Carpus.

Bandage for a Fracture of the Thumb.

XII. A Fracture of the Thumb-bones, being adequately reduced by our former Directions for that purpoſe, does then require a ſingle-headed Roller, or Tape near two Ells long and an Inch broad, which you faſten on by two circular Rounds about the Carpus, and then, proceeding to the fractured Part, you inveſt it by three circular Rounds, then placing two Splints of thick Paſte-

board

board on the back and inſide of the Thumb about a Finger's Breadth, you then make three more circular Rounds upon the ſame. And, laſtly, returning your Bandage to the Carpus, after making two or three Turns, it is there terminated and faſtened. When both Internodes of the Thumb are fractured, you then alſo apply the ſame Bandage with very little Variation, only repeating the Rounds upon each fractured Part ſeparately, and extending the Splints over both the Joints.

Bandage for a fractured Finger.

XIII. For a Fracture of the Finger you are to apply the preceding Bandage in the foreſaid Manner upon the fractured Part; only you muſt afterwards bind the fractured to the next found Finger, as a Support for it, till the Fragments are firmly united.

Bandage for ſeveral Fingers fractured.

XIV. When more than one of the Fingers are fractured, after an adequate Reduction, you take a Bandage three Ells long, and two Fingers broad, and, making two Circular Rounds about the Carpus, you carry it from thence over the back of the Hand to the affected Fingers, binding it round about all of them, ſo as to leave no Part uncovered. Then the Palm of the Hand is to be expanded upon a piece of Paſteboard, *Tab.* XXXVI, *Fig.* 5. and to be ſecured in that Poſition by the Bandage. Though there are ſome, who think it better to retain the Fingers a little inflected, by graſping a large Ball, inſtead of the flat Splint, upon which firſt they are alſo to be ſecured by a Ligature or Bandage, as upon the Splints. And upon which ſoever of theſe you ſuſtain the Fingers, the Bandage is at laſt to paſs from the Fingers to the Carpus, upon which it muſt be faſtened, and the Hand afterwards ſupported conſtantly by a Sling about the Neck.

Bandage for luxated Fingers.

XV. Luxations of the Fingers are generally ſo eaſy to cure barely by Extenſion, that there is ſeldom any Occaſion for Bandage; except the Diſorder has been long neglected, and the Joint appears extremely weak; and then you may apply a band an Ell and half long, and a Finger broad, much in the manner we directed for them when fractured, making firſt two circular Rounds about the Carpus, from thence carrying it over the back of the Hand to the luxated Finger, binding it round the affected Joint, and, croſſing it over the ſaid Joint in a crucial Manner, the Bandage is then carried round the Carpus again; which Courſe, being thrice repeated, its End at laſt terminates, and is faſtened upon the Carpus. If more than one of the Fingers are luxated, they are each of them to be bound up in this manner ſeparately; which kind of Bandage is uſually termed by the *French*, *Le demi Gantlet*, or the half Glove, as inveſting the Hand only without the Fingers.

Bandage for an amputated Finger.

XVI. When the End of a Finger has been either by Accident cut off, or deſignedly amputated on account of a Mortification, or a Caries of the Bone, after the uſual Remedies laid upon the Wound, you apply the ſame Bandage and Dreſſings, which we before directed for the Penis, *viz.* firſt ſome ſcraped Lint, then a Plaſter and Compreſs in Form of a *Malta* Croſs, *Tab.* II. *Fig. e*, and laſtly a Fillet of a Foot long, and a Finger's breadth, *(Tab.* II. *e.)* is to be cloſely and neatly applied round the Finger.

Bandage for an Amputation of the Hand, or Cubitus.

XVII. After an Amputation of the Hand or Cubitus, having applied the Remedies, Lint and Compreſſes, as we before directed in Sect. VIII. of our Chapter on the Operation. You then take a double-headed Roller about five or ſix Ells long, and three Fingers broad, fixing about a Hand's Breadth of its middle above

above the amputated Place *c*, *Tab.* XXXVIII. *Fig.* 19. you make three or four circular and tight Rounds, to ſecure whatever Dreſſings *a* are laid on the Stump. Then either of the Roller-heads is carried from *c*, over the Stump *d*, and, aſcending up on the other Side, it is traverſed by the other Head, which binds it down, and keeps moving round the Limb; then the former Roller-head is reflected back a little obliquely over the Stump again to where it it came from, and ſo on in the manner we directed in making the Capeline for the Head and Clavicle; which Courſe is to be repeated till the Stump and its Dreſſings are well covered. Then the ſhorter End of the Bandage is to be faſtened down by the ſpiral Turns of the longer Head, by turning the firſt upward and downward, and the Extremity of the laſt muſt be well ſecured by Suture. You muſt obſerve to make this Bandage pretty tight, to retain the Dreſſings more firmly upon the Part, and to prevent the divided Veſſels from bleeding, by compreſſing them. When your Deligation is compleated, the Patient muſt be put to Bed, and the amputated Limb raiſed upon a Pillow; and, to ſtop its bleeding the ſooner and more effectually, an Aſſiſtant ſhould compreſs the Parts with his Hands, till the Patient is out of Danger.

Bandage for an amputated Arm.

XVIII. When the Arm is taken off above the Cubitus, or Elbow, having tied up the divided Arteries, and applied the uſual Dreſſings, the Deligation muſt be performed almoſt in the ſame manner with that in the laſt Paragraph; only your Roller muſt here be longer, about ſix Ells, and applied over a long and thick Compreſs, laid on the brachial Artery within-ſide the Arm, and extending from the Amputation to the Axilla. But when the Arm is amputated near the Shoulder, the remaining Stump being not longer than three or four Fingers Breadth, having taken up the larger Blood-veſſels with Needle and Thread, it will then be neceſſary to apply a double-headed Roller that is eight Ells long, and three Fingers broad, in ſuch manner that the Roller-head, which, in the laſt Caſe, made the Reflexions or Croſſes over the end of the Stump, may here paſs round the Thorax, under the ſound Axilla, and, being brought round again to the Stump, you muſt therewith cloſely inveſt the ſame; for, without that Round about the Thorax, the reſt of the Bandage will eaſily ſlip off from the end of the Limb. But if there is little or no Stump left behind, it will then be convenient to make your Deligation in the manner we ſhall direct for an Amputation of the Arm in its Articulation with the Scapula in the ſubſequent Paragraph.

Bandage for an Amputation in the Shoulder.

XIX. In Caſe of amputating the Arm in the very Articulation of it with the Scapula, after treating the Wound as we before directed, (in Part II. Sect. I. Chap. XXXVII. Sect. VIII.) your Deligation muſt be compleated in the following manner; Take a ſingle-headed Roller ten or twelve Ells long, and four Fingers broad, the End of which is to be fixed under the ſound Axilla, and there held by an Aſſiſtant, conducting the Roller-head a-croſs the Breaſt to the amputated Shoulder, which it paſſes over, and returns croſs the Back again to the ſound Axilla, which Courſe is again repeated, after which the Roller is carried from under the ſound Axilla, over the ſame Shoulder behind the Neck, and, paſſing over the Amputation, it goes again over the Breaſt to the ſound Axilla; and, paſſing round the ſame Shoulder, it now returns over the Breaſt, and croſſing the former Turn like an X; which laſt Courſe being ſeveral Times repeated, the Remainder of the Bandage is ſpent circularly round the Thorax and

and amputated Part, to ſecure the Dreſſings, and confirm the whole Deligation, which being finiſhed, the end of the Bandage muſt be ſecurely faſtened, where it terminates, by Suture.

CHAP. VII.

Of Bandages for the Leg *and* Thigh.

I. IN deſcribing the Bandages for the lower Extremities, we ſhall firſt conſider thoſe which are proper to the Thigh, and then treat of thoſe belonging to the Leg and Foot. And, among the firſt, we ſhall begin with that for a Fracture of the Thigh-bone, which Bandage muſt be differently applied, according to the particular Circumſtances of the Fracture, as it happens either in the Neck, lower, middle, or upper Part of the Femur; different Artifices are alſo to be made in applying the Bandage, according as the Fracture is either oblique, or tranſverſe, or below the Neck of the Femur. For, when the Fracture is below the Neck of the Femur, either in its middle, or towards the Knee, after the Reduction, *&c.* as in our Diſcourſe on Fractures, you are then to apply the Bandages, two of which are to be four, and the other three Ells long, and each about three or four Fingers broad, all of them rolled up with ſingle Heads. But before the Rollers are applied, you muſt dip a ſingle piece of Linen (ſlit with four Heads as in *Tab.* II. *Fig.* 18.) in warm Wine, its Spirit, or *Oxycrate*, which is to be laid Round the fractured Part of the Thigh, ſo that the Heads go over, or a-croſs each other; then a long and thick Compreſs is to be extended upon the Femur, according to the Length of the Thigh, in order to fill up the natural Excavation in the poſterior Part of the Bone, leſt, without this, the Bandage might too much ſtraiten and elongate the Bone. This done, the Thigh is now to be taken hold of, above and below the Fracture, by two Aſſiſtants, who are to lift it up, while the Surgeon firſt applies the ſhorteſt Roller, beginning with three tight circular Rounds on the Part fractured, and as we before directed for the Arm in Chap. VI. Sect. I. after which the Roller aſcends gradually by ſpiral Rounds towards the Inguen, where it terminates by two or three circular Rounds, and is then faſtened. You next take one of the four Ell-rollers and making two or three circular Rounds, where the Proceeding began, but, in a contrary Direction, and folding the Compreſs together, (*Compreſſe graduée*, as the *French* term it) in the manner of *Tab.* IX. *Fig.* 1. you deſcend by ſpiral Rounds down to the Knee, below which it terminates by two or three circular Rounds, and its End is then faſtened. You muſt ſtrictly obſerve to make the Rounds of your Bandage much tighter, when the Fracture is oblique, than when it is tranſverſe. In the next Place, you apply four Compreſſes of about a Span in Length, and three Fingers Breadth, and over them four Splints of the ſame Length and Breadth, for retaining the Fragments of the Bone; though inſtead of four narrow Splints, you may conveniently apply two large ones, as M. PETIT adviſes. About the Splints you are to faſten the third and laſt Roller of four Ells long, beginning by two or three circular Rounds in their middle over the fractured Part, from thence aſcending by ſpiral Turns upward, and then deſcending in the ſame manner, till the Splints are well covered

Bandage for a Fracture of the Femur.

covered, and the End faſtened where it terminates, by Pin or Suture. Laſtly, the whole Thigh is to be ſuſtained by two other Splints of thin Deal, or ſtiff Paſteboard, which are to be tied on by three or four Tapes, in the ſame manner as we directed for the Arms in Chap. VI. Sect. I. *Tab.* XXXVIII. *Fig.* 17. *aaa*, *bbb*.

Poſition of the Thigh after Deligation.

The Deligation being in that manner compleated, the next Buſineſs is for the Surgeon to place the Thigh in the moſt convenient Poſture, for which we uſe a kind of Mattreſs, or Straw-bed, furniſhed with two cylindrical Sticks covered with Straw, as in *Tab.* IX. *Fig.* 5. only here the two Sticks or Junks muſt not be both of the ſame Length, as they are for a Fracture of the Leg, or *Tibia*, for which this (*Fig.* 5.) is adapted; for that going within-ſide the Leg and Thigh, ſhould be juſt long enough to reach from the internal Ancle to the Inguen; and the external one to reach from the Hip, or ſuperior Part of the *Os ileum* to the external Ancle, or, as ſome will have it, long enough to reach from the ſaid ancle, all along the Side of the Body to the Axilla; for if theſe Supporters are not long enough, in an oblique Fracture of the Thigh, there is great Danger of its contracting and becoming ſhorter than the other, which will neceſſarily ſubject the Patient to halt in his Gate. However, M. Petit will not have the external one reach any higher than the upper Part of the Hip, which will prove always ſufficient, provided the reſt of the Deligation be tight. The Limb being thus carefully extended, ſo that the Great-toe may lie in a Line parallel with the Patella, or a little more outward, the Spaces about the Ancle and Ham are then exactly filled up with Lint or Tow. After this there are ſome Surgeons who inveſt the whole Leg and Thigh with large Compreſſes, which others think unneceſſary, to guard againſt any Injury from the external Ligatures, ſeven of which will be generally ſufficient to faſten the ſaid Straw-caſe about the whole Leg and Thigh, each about a Yard long, and tied three about the Leg (as in *Fig.* 20.) three about the Thigh, and the laſt, or ſeventh, which muſt be longer than the reſt, about the lower Part of the Abdomen. Though ſome prefer the application of a Napkin about the Abdomen, inſtead of the laſt Ligature. With regard to which Ligatures you muſt always obſerve, not only to place them under the Straw-caſe before the Limb is put into it, to avoid any agitation thereof on this Occaſion; but alſo to begin your tying of them with the middle one firſt, going on to each end, and making your knots on the out-ſide of the Thigh, both for Neatneſs and Conveniency. At the bottom of the Foot is to be placed the ſole of a Slipper, or a piece of Paſteboard cut into a proper Shape, as in *Tab.* IX. *Fig.* 6, 7. which is tied on by the three Strings *aaa*, ſo that thoſe two on the Sides may croſs each other about the Knee or Ancle like an X (*Tab.* XXXVIII. *Fig.* 20. *e*, *f*.) pinning them to the Bandage; but the third, marked *g*, may be faſtened to the moſt convenient Part of the Straw-caſe. And thus the Limb may be retained in the moſt commodious and natural Poſture, that when the Cure is compleated, the Patient may not be incapable of ſtanding upon his Leg, as hath been ſometimes the Caſe. But to prevent the Foot-board from preſſing too forcibly, and from being uneaſy, you may interpoſe a ſoft Compreſs betwixt that and the Foot, as in *Tab.* IX. *Fig.* 7. In like manner, you may alſo place a Sling of Linen under the Heel (*Fig.* 8. *a*.) to be tied round the Tarſus by the String *bb*, in order to prevent an Inflammation of the firſt, from the Preſſure of the Cal-

Calcaneum ſo long a Time againſt the Bed. But if that Contrivance does not free the Calcaneum from Uneaſineſs, and the lower End of the *Tendo Achillis* be injured by the Preſſure of the ſaid Sling; it may, in that Caſe, be convenient to ſew the two Heads of a broad Roller together at an Inch diſtance from each other, as in *Tab.* XXXVIII. *Fig.* 21. The two Heads *aaa* being fixed into the Excavation near the Ancle above the Calcaneum, will intercept the *Tendo Achillis*, and ſupport the whole. Laſtly, if this too ſhould prove uneaſy, which does ſometimes happen, you may interpoſe ſome ſoft Lint betwixt them. In the next Place the Leg and Thigh are to be fixed in the middle of a ſoft Pillow, which ſhould lie higher under the Leg than Thigh; and which Pillow ſome Surgeons faſten to a ſmooth Staff extending from the Hip to the Calcaneum, to retain the whole Limb in its rectilinear Poſture, and, to prevent the ſame from moving to either Side, Ligatures are faſtened to the middle String on the Leg, and to Nails drove on each Side of the Beadſtead, and then a pair of Sheets are to be rolled up, and laid one on each Side the Limb, all which are equally neceſſary to be obſerved, as well for Fractures of the Leg, as of the Thigh. Laſtly, Some apply a kind of Arch, like the top of a Waggon's Arſe, made of ſmall Hoops figured by SCULTETUS in *Tab.* LVI. *Armament. Chirurg. Edit. in 4to, An.* 1666. or the one half of a Drum or deep Sieve may be uſed inſtead thereof, to keep off the Bedcloths from preſſing, ſo as to render the Limb uneaſy. For the reſt, you may conſult what we have ſaid in the Chapter on the Fracture of the *Femur*, in the firſt Part of our Surgery.

Bandage for an oblique Fracture of the Femur.

II. In an oblique Fracture of the Thigh, it will not only be neceſſary to make the Bandage ſtricter, but alſo to be more ſollicitous to keep the Limb duly extended. For this purpoſe you ought therefore to obſerve what has been ſaid at Sect. VIII. of our Chapter on this Fracture, with what follows. Betwixt the Thighs you muſt place a large Linen-cloth folded together, ſo that it paſs over the Inguen of the affected, and under the Buttock of the ſound Thigh, the Ends of which Cloth are to be nailed on each Side the Bedſtead, to keep the Patient's Body from deſcending. Then another Ligature muſt be made above the Knee upon the Thigh affected, which muſt again be faſtened to the bottom of the Bedſtead, to prevent the Limb from contracting upward. If theſe Ligatures or Stays ſhould in Time prove uneaſy, you muſt change their Places, the upper one paſſing now under the Buttock of the affected Thigh, and up over the Inguen of the ſound; and the lower one taken off from the Knee, and applied to the Ancle, and ſo alternately, till the Callus of the Fracture is firm enough to reſiſt the Contraction of the Muſcles, which would otherwiſe render that Thigh ſhorter than the other. The Surgeon will alſo do well to let the Patient have a little Block covered with Linen, at the Beds Feet againſt his ſound Foot, that thereby he may raiſe himſelf, and extend the other, when he finds his Body has deſcended. Which Precautions are alſo neceſſary to make an exact Cure of tranſverſe Fractures of the Femur, though more eſpecially for the oblique.

Method of renewing the Bandage.

When the Bandage has been well applied, and nothing extrordinary forbids, it ſhould not be taken off, and renewed before the eighth or tenth Day. But if the outermoſt Bandage appears too tight or lax, or ſome other Cauſe ſhould make it neceſſary to renew the ſame, it muſt be taken off, and re-applied with great Caution; nor ought the ſecond and third Roller to be taken off before the

End of the Fortnight; even the laſt ſhould continue on till the Cure is compleated, which is ſeldom accompliſhed in the Fragments of this very large Bone, before the ſixth Week after the Reduction of the Fracture; which will even require eight, nine, or ten Weeks for a Cure, in Patients of a bad Habit, or far advanced in Years. And though the callus may ſeem ſufficiently firm, and the Cure compleat, at the Expiration of that Time, yet the Patient ought not to walk for a conſiderable time afterwards without Sticks, and even Crutches at the Beginning; or elſe the Patient will be in Danger of relapſing into a ſecond Fracture of the lately reduced Bone.

Bandage for a Fracture in the Neck of the Femur.

III. For a Fracture in the Neck of the Thigh-bone, you muſt apply the Bandage, which we before deſcribed in Chap. V. Sect. VIII. under the Denomination of *Spica Inguinalis*; the Form of which we have repreſented in *Tab.* XXXVIII. *Fig.* 16. only here your Roller muſt be four or five Ells long, and three or four Fingers broad, which muſt be very ſtrictly applied, and the Limb kept well extended downward, or elſe the Contraction of the femoral Muſcles is ſo ſtrong, that the lower Part of the Bone will be drawn above the upper, ſo that its Neck cannot unite with its Head; conſequently that Leg will be ſhorter than the other, and the Patient muſt halt. Towards the End of your Roller it muſt terminate by circular Rounds about the Thigh, and be faſtened by Pins or Suture. The Limb is then to be fixed in a Straw-caſe, as before, and the Patient ordered to lie very ſtill in his Bed; and, for the reſt, you muſt obſerve what has been ſaid in the two preceding Paragraphs.

Bandage for a Diſlocation of the Femur.

IV. The *Femur* is nothing near ſo eaſily or frequently luxated by external Violence, as is commonly imagined; but it may be ſo more frequently from internal Cauſes, mentioned in our profeſſed Chapter on this Subject. But as, when the Head of the *Femur* is thruſt out of its Socket, and its Ligaments debilitated by a Collection of viſcid Humours, or a ſcrophulous State of its mucous Glands, thoſe Humours are very difficult to diſperſe or remove, 'tis no wonder that Patients thus afflicted are ſcarce ever cured, without halting afterwards. However, to afford all the Aſſiſtance we are able, a Compreſs, dipt in warm Wine, or *Oxycrate*, muſt be firſt laid round the Juncture of the Thigh, and then ſecured by the *Spica inguinalis* Bandage before deſcribed in Chap. V. Sect. VIII. and repreſented in *Tab.* XXXVIII. *Fig.* 16. And, laſtly, the Patient muſt reſt in his Bed for a Month: When it proceeds from ſome Diſorder or Diſtortion of the Ligament, you ought every Day to repeat often the Uſe of Fomentations *ex Sp. Vini Rect. Sp. Matricali, roriſmarini, Lavendulæ*, &c. with proper ſtrengthening Plaſters.

Bandage for a perpendicular Fracture of the Patella.

V. We have elſewhere obſerved, that the Patella may be fractured either in a perpendicular or tranſverſe Direction. The moſt convenient Deligation for the firſt, will be, after Reduction, and defending the Tendons in the Ham by a thick Compreſs, to apply the uniting Bandage, *Tab.* II. *Fig.* 1. of about three Ells long, and two or three Fingers broad, ſlit in its middle longitudinally for about three Fingers broad, and rolled up with two Heads. 'Tis applied much in the ſame manner with that for longitudinal Wounds in the Forehead, Chap. II. Sect. V. *Tab.* XXXVII. *Fig.* 3. That is, the middle of the Slit being laid on the Patella, one of the Roller-heads is carried round the Ham, and paſſed through the ſaid Slit, and, by drawing the two Roller-heads tight in each Hand, the Bandage by that Means cloſely and adequately inveſts the Articulation

tion and fractured Patella, whoſe two Sides are thus retained cloſe to each other. Then each Head of the Roller is carried above and below the Knee as long as the Bandage will permit, till its End terminates, and is faſtened in the ſame Courſe; but in the mean Time you ſearch with your Fingers, to know if the fractured Parts of the Patella are adequately replaced and conjoined. Being thus far advanced, you now impoſe a Compreſs on the Patella, and fix a ſtiff Paſteboard Splint in the Ham, both which are to be previouſly madefied in warm Wine, and retained by a Bandage of two or three Ells long, to be ſpent round the Part in a ſpiral Courſe; which laſt Part of the Dreſſing is to keep the Knee duly and equally extended, till the fractured Parts are conjoined by an uniform Callus. Laſtly, you apply the Straw-caſe, *Tab.* IX. *Fig.* 5. by tying it on the Leg with three or four Tapes, as in *Tab.* XXXVIII. *Fig.* 20.

Bandage for a tranſverſe Fracture of the Patella.

VI. When the Patella is fractured in a tranſverſe Direction, as it is much more frequently than in the perpendicular one, after the Extenſion of the Limb, and Approximation of its fractured Parts, with the uſual Dreſſings of a Plaſter, *&c.* as in our Diſcourſe on this Fracture; you then take a Bandage of three Ells long, and as many Fingers broad, which may be applied in a two-fold manner, according as it is rolled up, either with but one or with two Heads. The firſt, or double-headed Roller, is applied immediately above the Knee, by making a circular Round *d* about the Thigh, above the ſuperior half of the Patella *a*, *Tab.* XXXVIII. *Fig.* 22. Then the Roller-heads, croſſing at the Ham, are brought obliquely forward below the Knee, in the Round *e*, they are then carried back again, and the ſame Courſe repeated above and below the Patella, as long as the Roller laſts, obſerving, in the mean Time, to keep the fractured Parts adequately together in their due Poſition.

1ſt Method.

2d Method.

The ſecond Method of applying this Bandage is, by rolling it up with a ſingle Head, and fixing its End immediately above the reduced Fragments of the Patella, at the Knee, marked *a:* You firſt make ſeveral circular Rounds about the Thigh *b*, to faſten on the End of the Bandage, from whence you carry the Roller-head obliquely behind the Ham, to the upper Part of the Leg below the Knee, where you make the circular Round *e*, cloſe to the inferior half of the Patella, thence taking it obliquely a-croſs the Ham, traverſing the former, you go round the bottom of the Thigh *d*, thence again deſcending below the Knee like a Figure of 8, which Courſe is to be repeated till the Bandage is ſpent. In the next place, you muſt here alſo obſerve to keep the fractured Parts adequately together during the Deligation, and when that is finiſhed, you muſt apply a Compreſs, dipt in warm Wine or *Oxycrate*, to the Patella, and a Splint to the Ham, which are to be ſecured by a ſeparate and ſpiral Bandage as before, that the Knee may not have the leaſt Motion, which would be here highly injurious. There are ſome Surgeons, who apply a peculiar Inſtrument to keep the Leg extended, and from moving; for which conſult our Chapter on this Fracture, in the firſt Part of our *Surgery*; which Inſtrument is frequently attended with the deſired Effect. Laſtly, you may apply the Straw-caſe upon the Leg, as in *Tab.* XXXVIII. *Fig.* 20. in order to compleat your Retention thereof. But as it will be impoſſible to avoid ſome Stiffneſs of the Joint, by keeping the Limb thus extended without the leaſt Inflection, for ſo long as nine or ten Weeks, the Patient will conſequently halt more or leſs with that Leg; which you muſt endeavour to mitigate and remove, by the frequent Application

of emollient Topicals, as Ointments, Fomentations, *&c.* giving the Joint an ample and frequent Motion afterwards. We ſhall conclude with the common Obſervation, that they who have once fractured this Bone, will, from the Weakneſs and Stiffneſs of the Joint thereby induced, be continually ſubject to ſtumble, or halt more or leſs, and will therefore hardly eſcape breaking the other Patella, or the ſame at another Time.

A third Bandage for a Fracture of the Patella.

VII. As it is ſo difficult to retain the Fragments together in a tranſverſe Fracture of the Patella, Surgeons have therefore invented another kind of Bandage, which they make of a piece of Linen, about two Feet long, and thrice folded together, ſo as to be eight Inches broad: Out of this, *Tab.* XXXVIII. *Fig.* 23. they cut a piece C D, about two Inches broad from the End B B, leaving the End A entire; the Part *c*, which is thus excavated, to adapt it to the Patella, is then applied above the Knee as betwixt *d*, & *b*, *Fig.* 22. ſo that the Excavation C may inveſt the Patella. In the next Place, they apply the ſingle-headed Roller preceding by three Rounds about the Thigh, over the Cloth or Compreſs, in the Courſe of *d*, *Fig.* 22. over theſe Rounds they reflect the entire End of the ſaid Cloth, and then repeat the Round at *d* thrice more, to bind down and ſecure the ſame; which done, they take the two Ends of the ſaid Cloth (*Fig.* 23. B B) on each Side of the Patella, and order an Aſſiſtant to draw them down tight, that the ſuperior half of the Patella may be brought to the inferior; then the Roller, croſſing over the Ham, forms three circular Rounds *e*, *Fig.* 22. below the Knee or Patella, upon the two Ends of the Cloth, and the two Ends of the ſaid Cloth are next turned back over the firſt Rounds; and then the Roller again paſſes thrice about them circularly, to ſecure them firmly, the Remainder of the Bandage being ſpent in Turns above and below the Patella, and its End is faſtened by Pin or Suture where it terminates. You may alſo uſe the double-headed Roller for this purpoſe, as well as the ſingle one now mentioned; and, laſtly, you are to diſpoſe the Limb for reſt in the manner before preſcribed.

Bandage for a Diſlocation of the Knee.

VIII. We cannot deſcribe a more convenient Bandage for a Luxation of the Knee, than thoſe before ordered for the Patella; eſpecially that for the tranſverſe Fracture of the Patella. And the Patient ought to keep his Bed and Chair at leaſt eight Days before he walks, that the Ligaments may recover their Tone, and become ſufficiently firm.

Bandage for a Fracture of the Tibia.

IX. For the Deligation of the Tibia after its Fragments are reduced, two Bandages are required, the one five, and the other three Ells long, each being three Fingers broad; to theſe add four Compreſſes, and as many Splints, each a Span long, with the reſt of the *Apparatus* deſcribed at the Beginning of this Chapter, Sect. I. for a Fracture of the Thigh. Your Deligation is performed firſt, by inveſting the fractured Part with a piece of Linen ſlit as in *Tab.* II. *Fig.* 18, and dipped in Spirit of Wine, or *Oxycrate*, diſpoſing its Heads on the Fracture, ſo as to decuſſate, or croſs each other; then three circular Rounds are made with the firſt Bandage over the Cloth upon the Fracture, and aſcending ſpirally about the Tibia, it at length goes round above the Knee, and then deſcends ſpirally on the Tibia, upon which, by reaſon of the Inequality above and below the middle of the Calf, it may be proper to re-inverſe the Roller, as we have directed for the re-inverſed Bandage. You now apply the Compreſſes and Splints to the Leg, as we before directed for a Fracture of the Arm; but the

the Compreſſes muſt here be folded together towards their bottom, to fill up the Inequality of the Leg near the Ancle, that the Tibia may be every where equally conſtringed; ſee *Tab.* IX. *Fig.* 13. Laſtly, you apply two Paſteboard Splints, dipt in warm Wine, or *Oxycrate*, and tied on by three or four Tapes; then ſupport the Leg with the Straw-caſe or Junks, *Tab.* IX. *Fig.* 5. and *Tab.* XXXVIII. *Fig.* 20, which muſt be long enough to extend not much lower than the Ancles, and not above a Hand's Breadth beyond the Knee, tied on by three or four Strings, *a*, *b*, *c*, *d*, and the Spaces filled up with Tow or Lint; and, laſtly, a Foot-board with its Sling for the Heel, *Tab.* IX. *Fig.* 6, 7, 8. muſt be fixed to the bottom of the Foot, as repreſented in *Tab.* XXXVIII. *Fig.* 20. C.

Bandage for a Fracture of the Tarſus and Metatarſus.

X. The Deligation for a Fracture of the Tarſus and Metatarſus, after Reduction, may be made either with a ſingle or double-headed Roller, three Ells long, and two or three Fingers broad: That with two Heads is applied firſt over the upper Part of the Compreſs, and round the Ancle, as in *Tab.* XXXVIII. *Fig.* 24. A, and, croſſing like an X over the Juncture of the Foot, the Roller-heads are then carried down round the Tarſus and Metatarſus, and, croſſing again under the ſole of the Foot, they riſe up, and croſs upon the Inſtep, or Metatarſus, and, going round the Ancles, are there faſtened, after two or three circular Turns.

The ſingle-headed Roller.

The Roller with a ſingle Head is faſtened on by two or three Rounds about the Ancle, from whence deſcending obliquely over the Inſtep under the bottom of the Foot, and from thence riſing up, it goes over its former Courſe on the Inſtep, or Tarſus, like an X, and ſo round the Ancles, ſo that it reſembles a Figure of 8 about the Foot and Ancle; the remainder being ſpent circularly round the affected Part of the Tarſus, where its End is faſtened. In very bad Fractures of this Part, the Foot ſhould be placed in a Straw-caſe with a Foot-board, *Fig.* 20. This Species of Bandage may be uſed for Fractures of the Toes, if you inveſt them ſpirally, as directed before for the burnt Hand and Fingers, and then tie on a Foot-board or Paſteboard Splint like a Sandal, as they are figured to have been wore by the Ancients.

Bandage for a Luxation of the Foot.

XI. For a Luxation of the Tarſus or Ancle, after reducing and treating it, as we have directed in our Chapter on that Subject, your Deligation may be performed in the ſame manner as we have but now preſcribed for a Fracture of the Tarſus: The Patient ſhould, in this accident, keep his Bed and Chair for a few Days, and, in the mean time, often bathe the Part with ſome ſtrengthening Spirit, till the Ligaments become robuſt, and the Pains vaniſh.

Bandage for Phlebotomy in the Foot.

XII. That the young Surgeon may not be ignorant how to apply the Bandage after Bleeding in the Foot; he muſt know, that it is made with a ſingle-headed Roller, an Ell and a half long, and two Fingers broad, the End of which is laid over the Compreſs, and there held with his left Thumb, ſo as to let about a Span of it hang down on the out-ſide of the Foot, as in the Deligation for Phlebotomy in the Arm; then conducting the Roller obliquely over the Tarſus, and round under the Foot, and over the Compreſs two or three times circularly like a Stirrup, it then goes obliquely from over the Tarſus round the Ancle, and from thence again obliquely over the Compreſs, down under, and round the Foot, and then again about the Ancle; which Courſe being repeated till the Bandage is almoſt ſpent, you tie the two Ends together upon the out-

out-ſide of the Foot; as in *Tab.* III. *Fig.* 1. E. Some begin this Bandage by two or three circular Rounds about the Ancle, then paſs obliquely over the Tarſus and Compreſs, under the Foot; and ſo up, and a-croſs the former Turn, like an X, and then again round the Ancle, as in *Tab.* XXXVIII. *Fig.* 24. A. B. faſtening the laſt End either by Pin or Suture. There are yet other leſs conſiderable Methods of making the Deligation after Phlebotomy in the Foot; but as in all of them there is ſome Reſemblance of a Stirrup, the Bandage is therefore uſually denominated the *Stapes*.

Bandage after an Amputation of the Leg or Thigh.

XIII. For an Amputation of the Leg, or Thigh, after the proper Dreſſings are applied, your Deligation is compleated in the manner we preſcribed for an Amputation of the Arm, *viz.* by the *Capeline*, or reflexed Bandage, deſcribed in Chap. VI. Sect. XX. *Tab.* XXXVIII. *Fig.* 19. only the Leg and Thigh require the Roller to be longer than that of the Arm.

CHAP. VIII.

Of the Deligation for a compound Fracture of the Leg.

Bandage for a Fracture of the Tibia with a Wound.

I. FOR a compound [a] Fracture of the Leg, after reducing the Fragments, cleanſing the Wound, and the Impoſition of proper Remedies or Dreſſings, we then apply a Bandage peculiarly adapted to the Caſe, furniſhed with eighteen Heads, or Leaves, like a kind of Book, (as in *Tab.* IX. *Fig.* 4, BB.) and therefore the *Germans* call it the *Book-band*, which is extremely well adapted for a compound Fracture, as it may be open or bound up, and the Dreſſings renewed without moving the Limb; whereas thoſe uſed in ſimple Fractures would diſtort the Fragments, and prove very inconvenient and hurtful; we ſhall therefore be very explicit in our Account of the Deligation with this Bandage.

Previous Diſpoſition of the Bandage.

II. Suppoſing your Fracture of the Tibia to be accompanied with an external Wound of the Integuments, as repreſented in *Tab.* IX. *Fig.* 4. A. after your Reduction of the Fragments, cleanſing of the Wound, and dreſſing with ſcraped Lint, and proper Medicines, you then take the Straw-caſe, or Bed, *Tab.* IX. *Fig.* 5 A A, B B, having three or four pieces of Tape, each a Yard long, placed under it, over which Caſe you again lay three other ſuch Ligatures in a tranſverſe Direction, and upon them the eighteen-headed Bandage, with its Leaves expanded, as in *Fig.* 4. BB. and in *Tab.* XXXVIII. *Fig.* 25. C C, D D, E E. Along the middle of the Bandage is to be laid a Compreſs of the ſame Length, and a Hand's Breadth; and thus you have the whole ready for receiving the Leg.

Its Application.

III. Your next Buſineſs is to place the Bandage and *Apparatus* under the fractured Leg, whilſt it is held up in a convenient Poſture by an Aſſiſtant; ſee *Tab.* IX. *Fig.* 4. *Tab.* XXXVIII. *Fig.* 25. and then to apply the two middle Leaves next the Leg, a-croſs each other over the Dreſſings upon the Wound, and round the Tibia; then proceeding to apply the two lower Leaves, and then

[a] The Ancients uſed the very ſame Bandage for compound, as for ſimple Fractures, as we learn from CELSUS Lib. VIII. Cap. X. N. 7.

the

the two upper, all of the first Order, exactly a-cross each other, not quite even and circularly, but a little obliquely, in the manner of CCC, DDD *Tab.* XXXVIII. *Fig.* 25. This done, you must next apply the Leaves of the next succeeding Order in like manner with the former, beginning with the middle ones, and ending with the uppermost, and drawing them close round the Leg, as in *Fig.* 25.

Application of the Splints and Compresses.

IV. When your eighteen-headed Bandage has been thus applied, you are next to lay two Compresses, one on each Side the Tibia, to whose Length they should be equal, and two or three Fingers Breadth, folded together towards the Ancle, as we observed in Chap. VII. Sect. X. See *Tab.* IX. *Fig.* 13. But they should be first dipt in warm Spirit of Wine, and imposing them on each Side the Tibia upon CCC, and DDD *Fig.* 25. *Tab.* XXXVIII. you then place the six largest Leaves of the last Order over them, marked EE, FF, GG, beginning, and proceeding in that Order. Two other Compresses are then imposed with a Splint of stiff Pasteboard, which are tied close round the Tibia by three Tapes, before placed under it for that purpose, making your Knots on the out-side of the Leg.

Posture of the Leg after Deligation.

V. The Deligation being thus compleated, the Leg must now be disposed to rest in the most convenient Posture, as in simple Fractures. For this End the Ancients fastened a Pillow round the Leg, as may appear from the Figures and Writings of Solingen, Purman, and others; but as their Method of retaining the Leg is not sufficiently firm and secure, it is more adviseable to use the Straw-case often mentioned, and described in Chap. VII. Sect. IX. And, for the rest, with regard to the quiet Posture and Support of the Foot and Heel, they must be conformable with what was before proposed in the Deligation for a Fracture of the Femur, Chap. VII. Sect. II.

Renewal of the Dressings.

VI. After the second Day it will be necessary to renew your Dressings and Deligation daily, or every other Day, according to the Quantity of Matter discharged; while you are performing which, the Leg must be discreetly and firmly held up by an Assistant; so that the Fragments and injured Parts may not be disturbed, and, after cleansing and dressing the Wound, the rest are to be applied as before at Sect. III. *& seq.* which Process must be repeated till the Wound is healed, and if that should happen before the bony Fragments are well united, it will be convenient to apply a common Bandage, or Roller, as in simple Fractures. Clean Bandage and Dressings must be applied with Care when the others are foul; and as for retaining the Leg in the wooden Case of Scultetus, *Tab.* LVI. that is less used, and more unhandy, than the Straw-case, especially in Camps, where these Fractures are very frequent, otherwise it is no despicable Machine.

Machines for a fractured Tibia with a lacerated or contused Wound.

VII. As for compound Fractures of the Leg, in which the Bone is much splintered, or the Wound greatly contused, or lacerated, it will be necessary to keep the Limb more exactly steddy, and at Rest, than the Straw-case will admit of; Surgeons have therefore contrived a Machine peculiarly adapted to the purpose, and consisting of three Brass-plates joined together by Hinges, *Tab.* IX. *Fig.* 9. which are to be applied together with the Foot-board, *Fig.* 6, 7, and 8; though there are some, who, notwithstanding, prefer the Straw-case even before this. But we are furnished with a much more laudable and curious Machine contrived for this, and other Fractures, by the ingenious M. Petit, of

which we find an accurate Deſcription and Figure in the Hiſtory of the Royal Academy of Sciences at *Paris*, for the Year 1718, as alſo in its Author's Treatiſe on Diſeaſes of the Bones. We have given you the Figure and Deſcription of its ſeveral Parts in our *Tab.* IX. *Fig.* 11, and XII, and in Chap. X. Sect. II. of our Book on *Fractures*, we have conſidered it at large [a].

Treatment of other compound Fractures.

VIII. Laſtly, for a Fracture of the Thigh with an external Wound, you muſt apply the ſame eighteen-headed Bandage we have now deſcribed for the Tibia; only here both it and the Straw-caſe muſt be proportionably larger [b]. For the reſt, though a Compound Fracture of the *Humerus*, or *Cubitus*, may be commodiouſly enough inveſted with this eighteen-headed Bandage, yet we generally make the ſame Deligation here as in ſimple Fractures of thoſe Parts; becauſe, the Bones, being pendulous, are more commodiouſly inveſted, and better ſecured by the Roller, than by the Bandage with eighteen Leaves. Thus have we finiſhed that moſt neceſſary and important Branch of Surgery, the Application of Bandages, and at the ſame Time brought our Chirurgical Syſtem alſo to a Period; being ſatisfied that if what is here propoſed be well underſtood, the Operator will be thereby eaſily enabled to invent others for any particular or uncommon Caſe that may come under his Care.

An EXPLANATION *of the* THIRTY-EIGHTH PLATE.

Fig. 1. Shews the Bandage for an Amputation of a cancerous Breaſt, in which A B C D denote the firſt Courſe of the Roller, E E the Compreſſes on the Dreſſings.

Fig. 2. Repreſents the Method of applying the T Bandage of HELIODORUS for Diſorders of the Breaſt; *a a* the tranſverſe Part which goes round the Thorax under the Breaſt, *b b* the two Ends of it ſlit, or perpendicular Part going over the Shoulders, and the Part covering the Breaſt, *d* the Neck intercepted by the Slips *b b*.

Fig. 3. Denotes the Four-headed Bandage for Diſorders of the Breaſts: *a* the entire Part of it laid over the Breaſt, *b b* its two upper, and *c c* its two lower Heads, which are tied together near the ſound Shoulder *d*.

Fig. 4. Repreſents the *Quadriga* Bandage for inveſting the Thorax, in which *a b c d e f g*, denote the firſt and ſucceſſive Turns of the Roller, deſcribed at large in Chap. IV. Sect. XIV.

Fig. 5. Gives a View of the Bandage for an *Omphalocele*, or umbilical Rupture, A the Compreſs preventing an Extruſion of the returned *Omentum* and Inteſtines, B B the Girdle Part that inveſts the Body, C the Scapulary ſuſtaining the former, *d d* two Slips of the Bandage which, paſſing betwixt the Thighs, are carried round the Nates, and faſtened to the Belt near the Hips at B B, that the Compreſs may not recede either above, or below the Navel.

Fig. 6. The Bandage for the Inguen, *a a* going round the Body *b b* betwixt the Thighs and *c* inveſtigating the Inguen, as you may alſo obſerve in

[a] We have a remarkable Fracture with a Wound deſcribed by VERDUC in his Treatiſe on Bandages, Chap. 44. and in SCULTETUS, Obſ. 82 and 84.

[b] Obſervations on a Compound Fracture of the Thigh, are given us by SCULTETUS, Obſ. 77, and 78.

Fig.

Fig. 1.

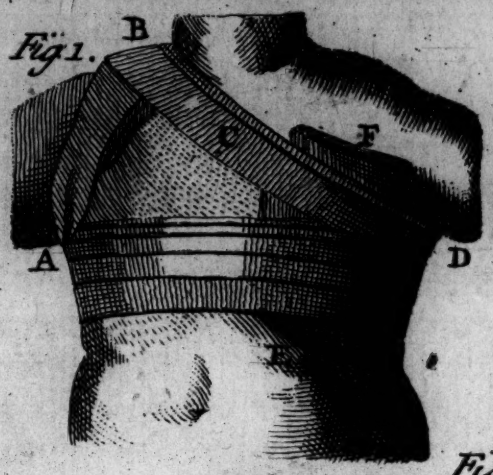


Fig. 2.

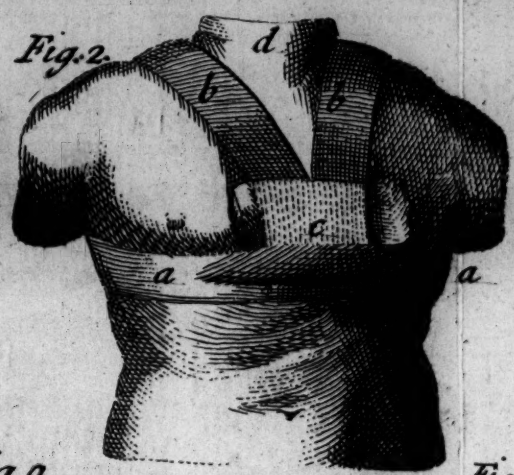


Fig. 3.

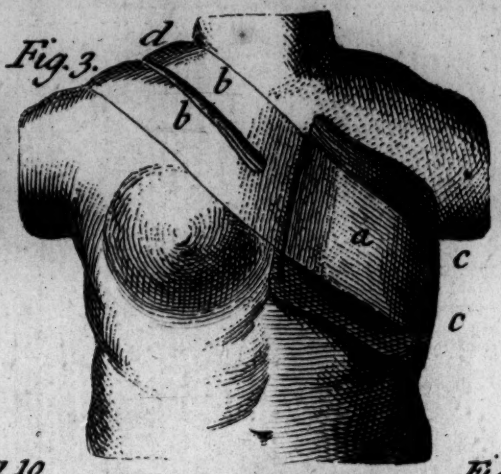


Fig. 4.

Fig. 9.

Fig. 10.

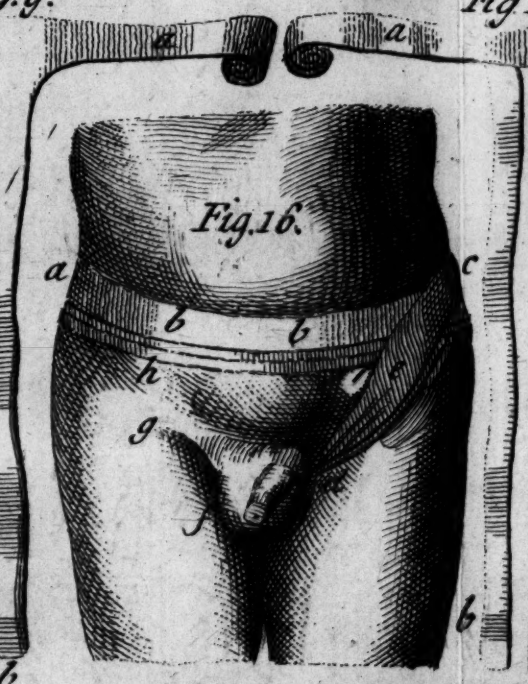


Fig. 11.

Fig. 8.

Fig. 16.

Fig. 15.

Fig. 17.

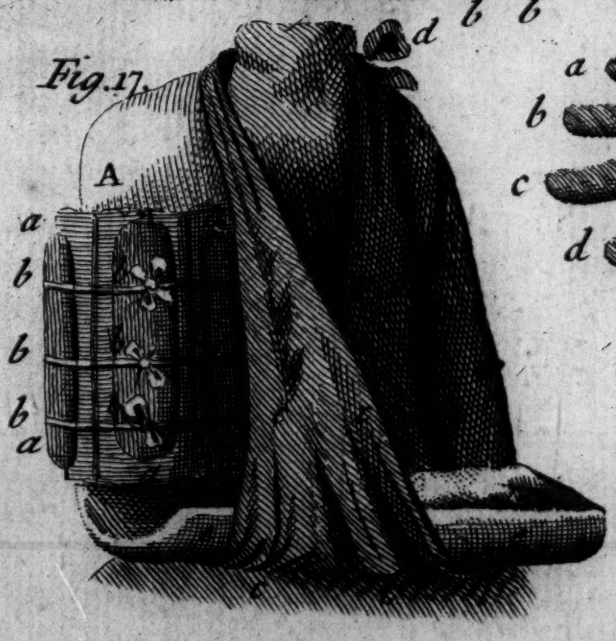


Fig. 18.

Fig. 21.

Fig. 19.

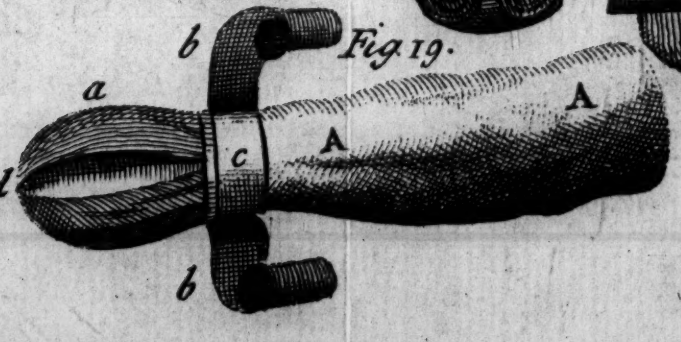


Fig. 20.

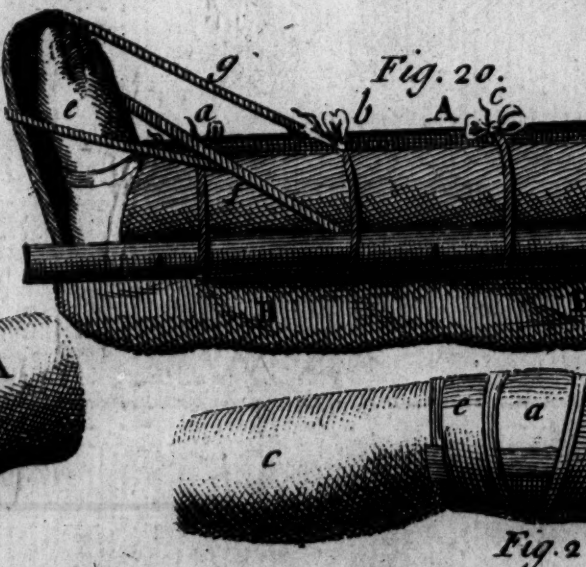


Fig. 2

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 12.

Fig. 13.

Fig. 14.

Fig. 24.

Fig. 25.

Fig. 23.

Fig. 22.

J. Mynde sc.

Fig. 7. The ſame inguinal Bandage applied to the Body.

Fig. 8 and 9. Shew the Bandage for inveſting the Scrotum: *a a* the tranſverſe Part that goes round the Body, *b b* its perpendicular Part ſlit in the middle, and perforated by the Aperture *c* to tranſmit the Penis. *Fig.* 8. ſhews it faſtened to the Body.

Fig. 10 and 11. Are different Forms of the double T Bandage for various Uſes.

Fig. 12. Shews the laſt of them applied to the Body for inveſting the Scrotum.

Fig. 13. Exhibits a Compound Bandage for the Scrotum, termed the *Suſpenſor*, and by the *French*, *La Bourſe*; A A the Part which receives the Scrotum like a Purſe. B B B the Girdle Part for inveſting the Body, C the Aperture to tranſmit the Penis, D D the two Heads which paſs betwixt and round the Thighs, and are faſtened upon the Hips by the Holes *d d*, with the Strings E E.

Fig. 14. Shews the Method of applying the T Bandage, *Fig.* 11. for Diſorders of the Anus, *a a* the tranverſe Part faſtened round the Body, *b* the unſlit End of the perpendicular Part retaining the Dreſſings on the Anus, joined to the other Part by the Suture *c c*, *d d* the lower Ends paſſing betwixt the Thighs, and faſtened before at the Pubes, or each Inguen, as in *Fig.* 12.

Fig. 15. Repreſents the double and knotted Bandage for each Inguen, ſerving many Uſes, and eſpecially to reſtrain the Bleeding after Lithotomy, or Syringotomy; its Application is deſcribed at large in Chap. V. Sect. VII. *a b c d e f g* ſhew the principal and ſucceſſive Turns in it, and the dotted Lines croſſing the Abdomen *h*, *c*, *d*, denote two Rounds under the Perinæum, and over the Shoulders, to compreſs the Parts more effectually.

Fig. 16. Is the *Faſcia inguinalis ſimplex*, which beginning at *a*, goes in the Courſe *b b* to *c*, and thence by *d e* to *c*, and again to its Origin *a*.

Fig. 17. Repreſents a fractured Arm A, ſecured with Splints and Compreſſes *a a a* tied over the Bandage by the three Strings *b b b*, with Knots on the outſide of the Arm, and ſuſpended by the Sling or Napkin about the Neck *c c c c*, tied in a knot on the ſound Shoulder *d*, and ſuſtaining the Paſteboard Caſe *e e*, for a Fracture of the Cubitus; which laſt is unneceſſary for a Fracture of the Humerus.

Fig. 18. Shews the Bandage for inveſting a burnt, or ſcalded Hand, the Application of which is deſcribed in Chap. VI. Sect. XI. preceding.

Fig. 19. Repreſents the manner of binding up a Stump of the Cubitus, after amputating the Hand: A A the Arm and Part of the Cubitus, *a* the Stump dreſſed, *b b* the two Roller-heads carried round the Compreſſes in the Circle *c*, and then croſſed over the End of the Stump *d*, as in the Capeline, or Reflex-bandage.

Fig. 20. Exhibits a Straw-caſe, and the manner of fixing it to the Leg: A A A A are two cylindric Bundles of Straw, with a Stick in the middle of each, B B the ſubjacent Pillow; C the Foot-board, *a b c d* four Tapes by which the whole is tied faſt to the Leg by as many Knots on the outer-ſide, *e f* the two Ligatures with which the Foot-board is faſtened to the Straw-cylinders on each Side in a croſs Direction, *g* the uppermoſt Ligature of the Footboard faſtened a little higher to the outer Cylinder.

Fig. 21. Is a double-headed Roller, ſewed together at each End ſo as to leave an Inch ſpace in the middle, *b*, for ſuſtaining the Heel and *Tendo Achillis* in Fractures.

Fig. 22. Exhibits the Deligation for a tranſverſe Fracture of the Patella; *a* the Patella, *b* the Thigh, *c* the Leg, *d e* the Turns above and below the Patella like a Figure of 8, croſſing in the Ham.

Fig. 23. Gives the Shape of a Linen-compreſs, to draw and keep down the ſuperior Part of the Patella in a tranſverſe Fracture of it, as in Chap. VII. Sect. VII. preceding.

Fig. 24. Shews the Deligation to be applied for Phlebotomy, a Fracture or Luxation of the Foot; A the circular Rounds above the Ancle, B the ſpiral and circular Turns about the Tarſus and Metatarſus.

Fig. 25. Teaches the Method of inveſting a compound Fracture of the Tibia, with the eighteen-leaved Bandage; A the Thigh, B the lower Part of the Leg, CCC, DDD the oblique Poſition of the Leaves a-croſs each other upon the Fracture, EFG the ſix outermoſt Leaves to be applied over the Compreſſes obliquely in that alphabetical Order as they are marked.

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